The role of a persuasive communication in changing attitude and behaviour to conservation

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The role of a persuasive communication in changing attitude and behaviour to nature conservation

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A Thesis submitted for the degree of PhD

King's College, London

Acknowledgements

I am extremely grateful to my supervisors, Professor Arthur Lucas, John Barker and especially Professor Jonathan Osborne, for the considerable help and encouragement they have given me through the years with this work. My thanks also go to Sue Minter and staff at Chelsea Physic Garden, The Natural History Museum, and Celia Mead and staff at the National Trust for the support they have given. My grateful thanks also go to my friends and family for the encouragement they have given, especially my son Charles for his expertise with the computer.

Abstract

This thesis investigates the role of a persuasive communication in changing beliefs, attitudes, intentions and behaviour towards the environment in three different settings. A variety of different media are used to carry the persuasive communications and the results are investigated through structured interview using questionnaires. The 'Theory of Reasoned Action' model of Ajzen and Fishbein (1980) is used as a theoretical basis for the design.

At Chelsea Physic Garden a display on endangered island plants and a leaflet 'Wake up to what you can do for the environment' persuaded visitors to be more environmentally friendly in their own gardens. At Studland beach a persuasive communication in a leaflet influenced more people to be prepared to take home their litter having seen the leaflet. At Avebury visitors' beliefs about their impact on the site were elicited by questionnaire before constructing a persuasive communication in a free leaflet. This leaflet had little effect on a subset of visitors, questioned in the exhibition, who were already aware of erosion and their impact on the site but it did have an effect on the general 'day out' visitor.

This research shows that understanding the prior knowledge and beliefs of visitors to botanical gardens and environmentally sensitive sites can guide the targeting of messages in displays, on interpretation panels, and in leaflets, towards effective persuasive communications which lead to desired changes in behaviour. The success of the messages depends on:

- the practicality of the behaviour change;
- the extent to which the messages provide visitors with relevant information to guide their actions; and
- the views of people accompanying the visitors who have an influence on their behaviour.

The implications of these findings for the underlying model and environmental management are explored.

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Chapter 1 Introduction

1.1 Overview

This thesis investigates the role of a persuasive communication in changing beliefs, attitudes, intentions and behaviour in three different settings. The first setting was a small botanic garden, Chelsea Physic Garden, London where the influence of a visit to a botanic garden, on visitors' awareness, attitude and behaviour towards nature conservation was studied. In particular the effect of visiting a targeted display about endangered island plants on awareness, attitude and behaviour towards nature conservation in their own gardens was researched through a structured interview. The second setting was Studland beach, Dorset, visited by about 1 million people each year where the effect of a persuasive communication, in a leaflet, on visitors' litter disposing behaviour was researched. The aim of the message in the leaflet being to persuade visitors to take their litter home. The third setting was Avebury, Wiltshire, the site of a Neolithic stone circle and other monuments. At Avebury visitors' beliefs about their contribution to erosion were investigated before constructing and testing a persuasive communication in a free welcome leaflet aimed at persuading visitors to avoid eroded areas. The 'Theory of Reasoned Action' model of Ajzen and Fishbein (1980) was used as a theoretical basis for the design of the research.

1.1.2 Research Questions

This research aims to answer the questions:-

1. Is it possible to successfully change visitors' behaviour in a leisure setting by persuasion?
2. Is it only possible to influence immediate behaviours or can there be a wider and more long lasting influence?
3. Is the Ajzen and Fishbein 'Theory of Reasoned Action' a valid model to use?
4. What factors contribute to a successful persuasive communication and successful behaviour change?
5. Are some behaviours easier to influence than others in a leisure setting?

The stimulus to carrying out research in this area was the strong belief that it is not enough just to increase public awareness of the issues involved in conservation. If major conservation issues are to be tackled then both attitude and behaviour change is needed and awareness must lead to action. For instance, if the amount of domestic waste disposed of in landfill is to be reduced then householders must separate out the different components of their waste and recycle, in whatever way is available to them. It is not enough that they are aware of the need to reduce waste; they must take some action to help solve the problem. Newhouse (1990) supports this approach in saying that the study of attitude and behaviour has profound implications for environmental conservation, as there is a growing recognition that technology alone can not solve environmental problems. Yet, in many areas, there is still the belief that awareness is enough. Recreational visits by the public to zoos and botanic gardens offer a unique opportunity for the venue to persuade visitors of the importance of conservation and begin to change their behaviour to help in the conservation of plant species and of wildlife in their own gardens. A review of the mission statements on the websites of a selection of major zoos and botanic gardens (see below) shows they have all signed up to conservation and public education.

Chester Zoo mission statement:

> 'The role of the zoo is to support and promote conservation by breeding threatened species, by excellent animal welfare, high quality public service, recreation, education and science' (www.chesterzoo.org, 2003).

Royal Botanic Gardens, Kew, education role:

> 'The role of education at the Royal Botanic Gardens, Kew is to increase public knowledge and understanding of the value and vital importance of plants and to increase recognition of, and support for, our work' (www.rbgkew.org, 2003).

Edinburgh Botanic Garden:

> 'Our mission is to explore and explain the world of plants'

(www.rbge.org, 2003).

Chicago Botanic Garden:

> 'Educational programs of the Chicago Botanic Garden foster appreciation and understanding of the remarkable world of plants' (www.chicago-botanic.org, 2003).

The Eden Project in Cornwall:

> 'Promote the understanding and responsible management of the vital relationship between plants, people and resources leading to a sustainable future for all' (www.edenproject.com , 2003).

No research seems to be available to monitor the success of these institutions in realising their mission statements. Indeed, individual exhibits at these venues can contain strong conservation messages as shown in this description of the 'Spirit of the Jaguar' at Chester Zoo.

> 'The conservation message is promoted very strongly throughout 'Spirit of the Jaguar', and reinforced at the end with information on our work to save jaguars and their habitats in the wild. One of the most poignant pieces of interpretation is the satellite imagery of rainforest destruction, kindly provided free of charge by NASA. It demonstrates the potential we have in a short period of time to destroy some of the things we value most' (Ruks, 2003).

When the cost of mounting new exhibitions is considered it is surprising that evaluation of the success of the messages is not carried out. The zoos and botanic gardens all sign up to conservation and are carrying out practical work in breeding endangered species but there is little research available on the effectiveness of the garden or zoo's communications with the public and whether they manage to change behaviour and therefore make a real difference in conservation terms. This research study explores one method to change behaviour when visiting a leisure setting and

investigates the effectiveness of using persuasive communications to alter attitudes and behaviour and contribute to conservation of the environment. Persuasion can be described as:

> 'Persuasion involves one or more persons who are engaged in the activity of creating, reinforcing, modifying, or extinguishing beliefs, attitudes, intentions, motivations and/or behaviors within the constraints of a given communication context' (Gass and Seiter, 2003).

It is a useful technique to use in leisure settings because these are places where people have come to relax and do not want to be met with multiple rules and regulations. This study looks at the extent to which persuasion can be used in a recreational setting to achieve some of the management actions needed rather than resorting to coercion, inducement and regulation.

1.2 The use of interpretation for persuasive communication

One of the methods used in attempting to alter attitudes and behaviour in leisure settings is through communications that persuade, used in the interpretation provided for the visitor. The definition used to describe interpretation is:

> 'a process of communicating to people the significance of a place or object so that they enjoy it more, understand their heritage and environment better, and develop a positive attitude to conservation' (SIBH, 1998).

Knapp et al (1997) reviewed a collection of text books, journal articles, agency guidelines and official memos which contained principles, goals and objectives for interpretation and concluded that behaviour change outcomes were of major importance for a significant proportion of the interpretive field. The behaviour change outcomes included community participation, resource preservation, energy conservation, park preservation and park protection. Yet the SIBH definition of interpretation quoted above does not mention behaviour change. Ballantyne (1998:

81) states that

> 'There is still some reluctance on the part of environmental interpreters to embrace a concern for environmental behaviour change which goes beyond the site specific and short-term target behaviours'.

The environmental interpretation field seems to be in a similar position to zoos and botanic gardens in that the importance of behaviour change is not wholly embraced. Murphy, Watson and Moore (1991) argue that the model of Ajzen and Fishbein provides useful leads in predicting behaviour change and that a model based purely on changes in knowledge leading to change in behaviour is not enough. Cable, Knudson and Theobald (1986) recommend the Ajzen and Fishbein model for evaluation of interpretation programs and state that:

> 'It provides a theoretical basis that suggests that interpretation can change people's attitudes, intentions and ultimately their behaviour.'

Broadhurst (2001) describes the link between information and attitudes. He states that information contributes to the development of attitudes and that our belief systems build incrementally from information coming in from a number of sources, to provide a model of the world. He shows the value of the information component within interpretation.

This research shows the use of interpretation in three different settings in promoting a behaviour change. Taking on Ballantyne's point the research study at Chelsea Physic Garden, in particular, investigated behaviour change in a wider dimension than just the site specific as the effectiveness of a persuasive communication in changing the visitor's gardening behaviour in his or her own garden was explored. Although the need to change behaviour in recreational settings has been identified there are few studies showing effective strategies. Roggenbuck (1992) states 'Surprisingly few published studies have been conducted to determine if persuasive messages actually reduce problem behaviors in wildland recreation settings.' He also

laments the lack of theory-based, empirical research on persuasion in recreation settings (Roggenbuck, 1992: 162). The studies at Studland beach and Avebury researched the effectiveness of persuasive communications in different recreational settings undertaken to research the wider relevance of the Ajzen and Fishbein model and the use of persuasive communications. From these three studies in recreational settings general conclusions can be drawn on the effectiveness of persuasive communications (in interpretative leaflets and panels) in altering attitudes and behaviour to conservation.

1.3 Chelsea Physic Garden

The first setting for study was a small botanic garden, Chelsea Physic Garden, London in 1992. This thesis explores the influence of a visit to this botanic garden, on visitors' awareness, attitude and behaviour towards biological conservation, and in particular, researches the effect of visiting a targeted display on endangered island plants on awareness, attitude and behaviour through a structured interview. This study also looks at the answers to the following questions:-

1. Did visitors attend to the messages in the exhibition?
2. Did visitors alter their attitudes to plant conservation as a result of visiting the exhibit?
3. Did visitors alter their behaviour towards plant and environmental conservation as a result of visiting the exhibit?
4. Was the Ajzen and Fishbein Theory of Reasoned Action a useful model to follow when promoting a behaviour change?

The role of Botanic Gardens has changed through the years; originally they had little to do with conservation.

'The original botanic gardens of Europe were medical foundations, intended to provide living specimens and supply drugs to students of medicine. Subsequently as their collections expanded with material brought from various parts of the World, opened up by exploration,

> the main role of botanic gardens became the scientific study of plant diversity for its own sake, combined with the development of horticultural skills' (Heywood, 1987: 3).

Today, there has been a significant shift in emphasis in their role. They are no longer concerned with supplying drugs to students of medicine, although in some cases botanic gardens are still involved with supplying plant material for screening for potentially useful compounds by drug companies. Sheringham in 1982 surveyed 22 British botanic gardens and identified four functions these gardens sought to fulfil: education, recreation, research and conservation. Of these, conservation seems to be a comparatively recent function, with the First International Conference on a conservation strategy for botanic gardens being held at Kew in 1975.

A number of articles have emphasised the importance of botanic gardens in increasing public awareness of the issues of plant conservation, (WWF, IUCN 1989, IUCN/UNEP/WWF 1991). In 1989 the Botanic Gardens Secretariat produced the Botanic Gardens Conservation Strategy (WWF, IUCN 1989: vii). This had 4 main aims, the first of which was to 'outline why the involvement of botanic gardens is an essential element in living resource conservation for sustainable development', and the 4th was to 'provide a coherent set of principles and procedures that will allow botanic gardens to plan their part, alongside other institutions, in achieving the maximum amount of long term conservation of plant species and populations *and focus public attention on the issues of conservation through appropriate educational displays and programmes*,' (emphasis added). The strategy contains other statements on a similar theme –'The botanic gardens and arboreta of the world offer unique opportunities for the education of a vast public. The aim should be to create an understanding and awareness of the needs for and methods of conservation and development of plant resources.'

In 2002 the Global Strategy for Plant Conservation was published by the Secretariat of the Convention on Biological Diversity. The Conference of the Parties to the Convention on Biological Diversity on the Global Strategy for Plant Conservation approved a number of objectives:

> 'The ultimate and long-term objective of the Global Strategy for Plant Conservation is to halt current and continuing loss of plant diversity.'

Within the sub-objectives there is one on promoting educational awareness of plant diversity which states:

> 'Articulate and emphasize the importance of plant diversity, the goods and services that it provides, and the need for its conservation and sustainable use, in order to mobilize necessary popular and political support for its conservation and sustainable use' (Sec. Conven. Biol. Diversity, 2002).

The importance of botanic gardens in increasing public awareness and support for conservation and sustainable use of plants is now clearly understood in the two documents quoted above.

There is little doubt that irreversible destruction of habitats in many areas of the world is taking place. The Sunday Times 4th October 1992 ran an article 'Rainforests will be gone in 50 years, warns UN report' (Ryan, 1992), taking as their source an unpublished United Nations study. According to the report the tropical rainforests are disappearing at the rate of more than an acre a second, an expanse of rainforest the size of England and Wales is being bulldozed or burnt every year. In 1987 Dr Peter Raven (Director of the Missouri Botanical Garden) estimated that as many as 60,000 plant species, almost a quarter of the world's total (250,000), would become extinct within the average lifetime of a child born today (Raven, 1987).

The role of botanic gardens in conservation of plant species can be considered in two different ways. The prime concern in plant conservation must be to conserve plants within their natural habitat, (in-situ conservation). Many botanic gardens do this, particularly in tropical countries, by holding reserves or protected areas as part of their land (e.g. Limbe, Cameroon). However where this fails it is possible to conserve ex-situ in a botanic garden with the hope of eventual reintroduction to the

wild. There are 1,500 botanic gardens in the world, growing up to 80,000 plant species, (BGCS pers. comm.). Many plants have been saved from certain extinction by botanic gardens e.g. *Lysimachia minoricensis,* extinct in the wild, but found as a cultivated plant in botanic and private gardens.

1.4 The role of botanic gardens in education

Apart from actually conserving the plants by holding seed banks and taking part in propagation and reintroduction programmes, botanic gardens can serve to educate the visitor in the importance of plant conservation. This cannot take place simply by holding a large collection of plants, endangered or otherwise, and allowing the public access to view them. In order to bring such information to the casual visitor it has to be communicated in an interesting and eye-catching way. This can be done for example by explanatory labelling, interesting displays, audio-visual programmes or information leaflets. At Chelsea Physic Garden a special display of endangered plants was mounted to portray the information on conservation issues.

If the cause of conservation is to be furthered, increasing awareness has to be followed by the need to alter attitudes and behaviour. *Caring for the Earth, a Strategy for Sustainable Living* (IUCN/UNEP/WWF, 1991) suggests, in part 1, that 'To adopt the ethic for living sustainably, people must re-examine their values and alter their behaviour'. Ultimately, human action will be the basis for the success or failure of sustained diversity of life. For instance, Maloney and Ward (1973) argue that the root of environmental problems is human behaviour. They describe the ecological crisis not as a technical problem but as a crisis of maladaptive behaviour.

1.5 Methods of influencing behaviour

If human behaviour is to be influenced into environmentally positive action a method of influencing behaviour has to be sought. Various models which have been used to attempt to influence attitude and behaviour towards the environment are reviewed in the literature review of this thesis, chapter 2. A characteristic of many studies of behaviour change is that they have been undertaken without the use of an underlying

theoretical model. Although not a problem in itself, the lack of a model makes it more difficult to draw the essential features from a particular study and apply them to another. A theoretical model provides an understanding of the processes involved in behaviour change which then allows us to predict and control human behaviour. There are many studies of a purely descriptive nature where the results may only hold good for that particular study which causes a difficulty in making reliable generalizations from individual studies. In this thesis models of behaviour change have been sought by researching the environmental education literature, advertising and marketing and social psychology literature. The environmental education literature reveals a number of descriptive models but none that would be applicable to a study of this sort, mainly because the models are a description of the findings of a study rather than describing a generalizable method for changing behaviour.

1.5.1 The Theory of Reasoned Action

After careful consideration the model used in this study to guide the intervention was the Theory of Reasoned Action (Ajzen and Fishbein, 1980). According to this theory a person's behaviour may be explained in terms of a limited number of concepts:

the person's intention to perform that behaviour,
the person's attitude toward the behaviour,
the subjective norm (i.e. the person's perception of the social pressures put on him to perform or not to perform the behaviour in question),
the beliefs underlying the attitude and subjective norms.

Beliefs are viewed as underlying a person's attitudes and subjective norms, and ultimately determining intentions and behaviours. Although a person can hold a large number of beliefs about a given object (s)he can attend to only a small number (5-9) of beliefs at any given moment. According to Ajzen and Fishbein, these salient beliefs are the immediate determinants of the person's attitude. According to the Theory of Reasoned Action, behavioural change is ultimately the result of changes in beliefs. In order to influence behaviour people have to be exposed to information which will produce changes in their beliefs. However changing beliefs will not

always affect a change in behaviour – for a number of steps intervene between beliefs and behaviour. The model assumes that a change in beliefs will affect a change in attitude or subjective norm. Attitudes are based on a total set of salient beliefs about performing a behaviour. Changing one or more beliefs may not be sufficient to bring about a change in overall attitude. Similarly changing one or more normative beliefs may have little effect on the subjective norm. If neither the attitude nor the subjective norm changes, a change in behaviour cannot be expected.

Various factors other than attitudes towards behaviour have been invoked by social and behavioural scientists to explain behaviour. Factors such as personality characteristics and demographic variables such as sex, age, race and social class have been used to explain behaviour. Although Ajzen and Fishbein recognise these as potentially important variables they do not constitute an integral part of their theory but are considered 'external variables'. They may influence the beliefs a person holds or the relative importance (s)he attaches to attitudinal and normative considerations but there is no necessary relation between any given external variable and behaviour. According to Ajzen and Fishbein, investigators have usually assumed that there are very different causes for different behaviours. Most of the factors invoked to explain behavioural phenomena of interest are external variables. This has led to a proliferation of theories linking external variables to behavioural phenomena. This is in fact not necessary if the Theory of Reasoned Action is followed. Also it is important to note that to predict a single behaviour a researcher has to assess the person's attitude toward the behaviour and not his attitude toward the target at which the behaviour is directed.

Using this model, if a botanic garden is to influence visitors' attitudes and behaviour towards conservation issues, the material on display must act on specific beliefs related to their conservation behaviour. The behaviour targeted in this study is the conservation behaviour of visitors in their own gardens. The target is wildlife-friendly behaviour and the context is the visitor's own garden. The time for the behaviour to be performed is any time after a visit to the display at Chelsea Physic Garden. Private gardens make up 3% of land area in Britain (Owen and Owen, 1975). As more land is swallowed up in development, gardens are becoming

increasingly important as havens for wildlife. If people can adopt management practices in their own gardens which are 'environmentally friendly' such as the use of compost heaps, a garden pond, a range of trees and shrubs providing food and nesting sites for birds, then they would be contributing to the conservation of wildlife in Britain. If people will buy artificially propagated bulbs, in preference to bulbs dug up from the wild, and do not buy peat, then they will be contributing to the conservation of the environment at home and abroad.

1.6 Studland beach

The second setting for research into behaviour change was Studland beach, Dorset in 1995, visited by about 1 million people each year. A persuasive communication in a leaflet was used to influence the visitor's beliefs, attitude and behaviour towards his or her own litter on the beach and in particular to persuade visitors to take their litter home. Using the model of Ajzen and Fishbein (1980) the behaviour was influenced by introducing a novel belief: - that it cost the National Trust and English Nature over £30,000 each year to remove litter left on the beach and nature reserves and in the bins. This money could be spent on looking after the wildlife. The aim of introducing this novel belief was to positively influence the attitude, intention and behaviour toward taking litter home. Three hundred and twenty-five questionnaires were completed by interview of both people who had received the welcome leaflet and those who had not (the control group). These questionnaires were analysed to evaluate whether the persuasive communication had made any difference to the litter disposing attitudes, intentions and behaviour of visitors. A survey of litter left on the beach was also undertaken to see if by changing people's litter disposing behaviour the amount of litter collected on the beach could be reduced and also to pinpoint any activities significantly contributing to the litter.

Litter and the disposal of waste are huge environmental problems. In Britain we produce more than 430 million tonnes of rubbish per year. The majority of this comes from industrial processes and business, with over 25 million tonnes being created in our homes. The amount we produce in our homes is predicted to increase at a rate of 3% per year, (www.wasteonline.org.uk, 2003). The draft waste strategy

for England and Wales *A Way With Waste* sets a goal of 30% recycling and composting of waste by 2010 (www.defra.gov.uk, 2003). Recreational settings such as beaches are one place where the message of waste reduction – reduce, reuse, recycle can be promoted. Studland beach was chosen as the second place for research into the effectiveness of the Ajzen and Fishbein model of behaviour change and effectiveness of the persuasive communication technique because there was an urgent need to reduce the amount of litter collected there. The first aim of the research study was to see if the persuasive communication in the free leaflet, given out to visitors as they entered the car parks in their cars, would change their litter disposing behaviour from leaving litter in the bins on the beach to taking it home and disposing of it in an environmentally friendly way at home. The second aim of the research was to see if by changing visitors' litter disposing behaviour the amount of litter collected on the beach could be reduced and therefore save the National Trust money. The study also surveyed litter on the beach to see if litter was predominated in certain areas such as around the beach cafés. Another aim was to investigate whether certain types of visitor were more predisposed to taking their litter home than others.

Various studies have been carried out in American National Parks aimed at reducing littering behaviour. Roggenbuck (1992) writes:

> 'A flurry of studies in the 1970s indicated that persuasion can reduce littering in park settings, but that the effectiveness of persuasion techniques varied widely depending on the type of behavioural intervention used.'

The results of the different studies seem to be quite specific to the studies and the unique characteristics of each situation which means that it is difficult to draw general points to apply to new situations.

Roggenbuck (1992) also states:

> 'The purpose of the persuasive message, its timing, the message content, recipient characteristics, and source variables all influence

> the success rates of persuasive communication. Some routes to persuasion are likely to be less appropriate and effective than others for some park management purposes.'

By using a different type of persuasive communication (i.e. in a leaflet) in a different setting using the Ajzen and Fishbein model to underpin and guide the work, it was hoped that this would help to give a wider scope to the generalizability of the use of persuasive communications in recreational settings and to this research.

1.7 Avebury

The third setting for research was Avebury, Wiltshire in 2002; the site of a Neolithic stone circle and other monuments visited by over 350,000 people a year. The research question investigated here was whether visitors' attitudes and behaviour towards erosion could be influenced by a persuasive communication in a free leaflet. This site provided a contrasting location and required a different type of behaviour change from the previous studies. Visitors' beliefs about the effects of visitors on the site and their own impact on the site were elicited by questionnaire before using this information to construct a persuasive communication in a free leaflet. The effect of the persuasive communication on a subset of the visitor population's beliefs, attitudes and behaviour towards their impact on the site was investigated using a questionnaire.

There seems to be very little research into the effects of changing behaviour towards erosion control. One example – the management of Hadrian's Wall depends on persuading people not to visit in winter.

> 'Communicating the winter message to visitors is perhaps the most formidable challenge facing the Wall's managers but without it the aim of maintaining its sense of place as a green sward would be even more daunting than it already is. The Wall's soils, in a nutshell, need a rest in the winter months because, as already explained, this is when their carrying capacity is considerably reduced....The winter

message, therefore, is about explaining the fragility and sensitivity of the soils during the winter and persuading visitors to visit, for example, the more robust paying sites and encouraging walkers to avail themselves of the large selection of circular walks situated within the Wall's corridor', (McGlade, 2001: 16).

There is, however, no data available to show the success of this strategy and the use of persuasive messages. Roggenbuck has reviewed various studies in recreation settings and found that: 'By far the most common visitor response to environmental deterioration in recreation settings is a failure to even notice the deterioration.' For instance, 'Helgath (1975) found hikers to be well satisfied with trail conditions in the Selway-Bitterroot Wilderness, even though many trails there were severely eroded'. 'Merriam and Smith (1974) found no correlation between visitor ratings of campsite physical condition in the Boundary Waters canoe area and expert ratings of the severity of environmental impacts at the sites'. 'Knudson and Curry (1981) studied visitor perceptions of environmental impacts at three Indiana state park campgrounds. Most respondents rated ground cover conditions as satisfactory to excellent, even in areas where over three-fourths of the campsite was bare or heavily disturbed', (Roggenbuck, in Manfredo, 1992).

This final study of this thesis widens the applicability of persuasive communications in the recreational setting still further by researching the effectiveness of using a persuasive communication to change where people walk on a site and support site management when controlling erosion. To do this it first studies the underlying beliefs of visitors as to the positive and negative impacts they have on a site. This information is then used to write a persuasive communication to persuade visitors not to walk on certain eroded areas. Again, the Ajzen and Fishbein model of behaviour change is used to guide the research.

1.8 Summary

The more we know about the factors which influence a decision to perform, or not perform a given behaviour, the more likely we will be able to develop effective

strategies and messages to influence people to change their behaviour in a given way. A study of the theoretical approaches to behaviour change will increase our understanding of why a person does or does not engage in a particular action. In chapter 2 of this thesis theoretical models for attitude change and behaviour change are explored. A theoretical model was sought to guide the intervention in this study which would be able to provide an effective strategy for behaviour change. It also needed to be of use in an informal educational setting and be of use in influencing attitude and behaviour towards the environment. Behaviour change by persuasion is attempted in many aspects of human life from consumer products to criminal behaviour. In this study three areas linked with environmentally advantageous behaviour change are investigated: environmental education, green advertising and social psychology.

The area of environmental education is investigated because the theories and methods behind producing environmentally responsible behaviour in pupils may yield a repeatable model which could be utilised. The development and review of formal courses in environmental education has been carried out through monitoring the effects of courses on environmental attitudes and behaviour of pupils. Research in this area has been stimulated by the desire to produce environmentally responsible behaviour in pupils.

Consumers can have a powerful effect on the environment through the products they buy and use, and the waste they throw away. Advertisers are aiming to change behaviour by persuading consumers to buy their products. The area of advertising is investigated to discover if there is an underlying theory to a successful advertisement which has an effect on changing consumer's behaviour.

Finally the field of social psychology was investigated because attitude and behaviour have long been the focus of studies in this field. Models linking attitude and behaviour were reviewed including Festinger (1962), Bem (1967), the Triandis model used by Boyd and Wandersman (1991), Ajzen and Fishbein (1980) and Petty and Cacioppo (1986). Of these it is argued that the Theory of Reasoned Action of Ajzen and Fishbein most closely suits the purpose of a model to guide the

intervention in this study.

In chapter 3 the methodology of behaviour change and the role of a persuasive communication in promoting behaviour change is explored. The elements which make up a persuasive communication are defined and what makes an effective persuasive communication is investigated. There are many different aspects of persuasive communications which have been studied for their effectiveness, including; the status and credibility, attractiveness, trustworthiness and non-verbal behaviour of the source. Message factors, such as whether the appeal is explicit or implicit, and audience factors are also considered. The conclusion is that the content of the message is of overriding importance.

Chapter 4 outlines the research methodology in the study at Chelsea Physic Garden including the design of the exhibit and justification for the method of data collection. The experimental design and questionnaire design are described and illustrated.

An analysis of the data collected is included in chapter 5 along with a discussion of who comes to Chelsea Physic Garden and why they come. The part of the visit which is memorable to the visitor is investigated, and the success of the display in altering attitudes and behaviour towards nature conservation is confirmed.

In chapter 6 the study of behaviour change towards litter disposing behaviour on Studland beach is described. The methodology and survey techniques used are described along with the results and conclusions of the investigation.

In chapter 7 a study of behaviour change at Avebury is described. This is a study of behaviour change towards walking on eroded areas of the Avebury World Heritage Site. The response of two different visitor groups to a persuasive communication is explored. The methodology in this study is described and the results obtained and conclusions discussed.

In chapter 8 the findings of the different studies are compared, contrasted and discussed. The relevance of these research studies to the world at large is discussed

and how transferable the results are to other situations is examined. The use of persuasive communications in other settings is discussed. The limits of persuasive communications in encouraging conservation-oriented behaviour are explored.

Chapter 2 A review of the literature showing models used in predicting and influencing behaviour

2.1 Introduction

There is a vast body of research on environmental education which addresses the role of attitudes and behaviour. A number of writers recognise the need not just to increase awareness of environmental issues but also to alter attitudes and behaviour towards the environment. Newhouse (1990:31) states that the study of attitude and behaviour has profound implications for environmental conservation, 'as there is a growing recognition that technology alone can not solve environmental problems. Ultimately, human action will be the success or failure of sustained diversity of life'. *Caring for the Earth, a Strategy for Sustainable Living* (IUCN/WWF/UNEP, 1991:11) suggests in part 1, 'To adopt the ethic for living sustainably, people must re-examine their attitudes and alter their behaviour'. Maloney and Ward (1973: 583) describe the ecological crisis not as a technical problem but as a crisis of maladaptive behaviour: 'Ultimately, the solution lies with the sciences that deal with changing human behavior.' Other writers who subscribe to the view that positive attitudes and behaviour towards the environment are important include Pettus (1976), and Iozzi (1989). Arising from such concerns, in June 1992, the United Nations Conference on Environment and Development (the Earth Summit) took place in Rio de Janeiro. The conference established a global environmental agenda for the 21st century called 'Agenda 21'. The implementation of this Agenda depends fundamentally on action taken at a local level. In many cases this means people changing their behaviour towards the environment. The Earth Summit in 2002 (Rio' Earth Summit +10) reviewed progress on the implementation of 'Agenda 21' and set goals for key environmental areas such as reducing the number of people without access to proper sanitation, restoring depleted fish stocks, and improving biodiversity by cutting the rate at which rare animals and plants are becoming extinct. In December 2003 the importance of behaviour change was again reiterated in a Guardian newspaper article. Paul Brown, environment correspondent quotes the Environment Agency report exhorting people to take action:

'As Britain throws away the extra 2.5m tonnes of rubbish generated by Christmas, the Environment Agency is urging people to make a pledge to save the planet. Taking a shower rather than a bath, planting a tree, and cutting down on the daily car mileage are among its 60 suggestions for reversing trends destroying the British environment. In its annual report it (the Environment Agency) says that small efforts by a sufficiently large number of people can make a big difference.' (Brown, 2003:7).

This literature review therefore seeks to identify the importance of behaviour change in addressing environmental problems. To be able to live sustainably there is a need to change the way people behave, not just their attitude toward the environment. This review describes the work done on the influence of knowledge and attitudes on behaviour and reviews the models which have been used to attempt behaviour change towards the environment. The specific purpose for reviewing the literature was to develop a model which could be used to guide the research which forms the substance of this thesis in influencing behaviour of visitors to Chelsea Physic Garden, Studland and Avebury. As the focus of interest is changing individuals' environmental behaviour the three main domains where relevant research on persuasion has been conducted: - environmental education, marketing and advertising, and social psychology, are explored.

The area of environmental education in its broadest sense covers education *about* the environment, education *for* the environment and education *in* the environment. In this review we are concerned with education *for* the environment i.e. 'education which is directed to environmental preservation or improvement for particular purposes', (Lucas, 1980). Education *for* the environment is characterized by its aims, unlike education *in* the environment which is characterized by the technique of instruction.

Much of the research work which has been carried out on the relationship between

environmental attitudes and behaviour has been instigated by a wish to develop and review formal courses in environmental education. There is a wealth of information which exists concerning environmental behaviour, but for the educator it is important to know what type or method of environmental education will be effective in promoting or changing behaviour to environmentally responsible actions. Although the research for this thesis involves an informal education setting, some parallels can be drawn from the models prepared for formal courses in environmental education which will also be reviewed in this chapter.

Nevertheless, although writers have identified the importance of positive attitudes and behaviour for the future of our environment, there is little research in environmental education into the supposed link between attitudes and behaviour and the process of changing an individual's behaviour toward the environment. In fact Iozzi (1989:4), in his summary of research into environmental education and the affective domain, shows that much of the research conducted in the area of environmental education and the affective domain has been essentially descriptive; that is researchers have attempted to develop environmental attitude profiles or environmental values profiles of various members of society. He finds that very few studies have 'attempted to determine the effects of specific interventions or programs designed to improve change, or alter existing attitudes or values and the ways they impact on the environment'.

Another problem highlighted by Lucas (1980:18) in his review of science and environmental education literature, shows the lack of understanding of the problems involved in relating attitudes and behaviour amongst the educators reviewed, 'Few reports in the environmental education literature refer to the extensive work that has been done elsewhere relating measured attitudes to actual behaviours'. Indeed Lucas goes on to suggest that the environmental education literature on attitude is effectively a closed literature, and that researchers must draw upon a broader literature than has been the case to determine factors which link environmental attitudes and behaviour.

Some environmental researchers have constructed models of environmentally responsible behaviour i.e. Hines et al (1986), but these are no more than a description of variables, such as knowledge of issues and knowledge of action strategies, which can be found to be associated with responsible environmental behaviour.

The second area investigated in this chapter for this research was the area of marketing and advertising green consumer products. The current trend in marketing green consumer products has led to an interest in the behaviour of consumers. Can the attitudes of consumers predict their buying behaviour? Can consumers be influenced to buy green products? This review will show that studies in this area are again of the descriptive type with attitude strength and behaviour not always corresponding (Alwitt and Berger, 1993). Again no method for influencing behaviour which could act as a model for this research was found in this literature.

Finally, in view of the lack of relationship between attitudes and behaviour found in the literature on environmental education and marketing and advertising of green products a model for influencing behaviour was sought from other areas. The field of social psychology was explored because attitude and behaviour have long been the focus of studies in this field.

In researching a model of behaviour change, for the purposes of this research study, a number of different models have been reviewed. It was important that the model which was implemented as part of the research study should meet the following criteria: That is to:-

- enable predictions and the design of interactions which would influence human behaviour; and
- provide an effective strategy for behaviour change.

In the particular experimental studies to be carried out at Chelsea Physic Garden, Studland and Avebury the model needs to meet two specific criteria that is:

- to be of use in an informal leisure setting; and
- to be of use in influencing attitudes and behaviour towards the environment and conservation.

Of the models reviewed in this chapter it is the work of Ajzen and Fishbein (1980) which, it will be argued, comes closest to fulfilling the above criteria. This model was found to be one which can be used to guide an intervention intended to influence behaviour. It gives a method for predicting behaviour and defines what ultimately determines human behaviour.

This chapter will argue that it is this model that is the most appropriate base for the research.

2.2 The Ajzen and Fishbein Theory of Reasoned Action

The Ajzen and Fishbein model is introduced here as it is a point of reference throughout the thesis. The Theory of Reasoned Action (TRA), developed by Ajzen and Fishbein (1980), links the behaviour of a person to the intention to perform that behaviour as the best possible predictor of that behaviour. A person's intention is a function of two determinants; one personal, the other affected by social influence. The personal factor is the positive or negative evaluation of performing the behaviour; this factor is termed the attitude toward the behaviour. The second determinant is the person's perception of the social pressures put on him to perform or not perform the behaviour; this factor is termed the subjective norm. According to Ajzen and Fishbein, attitudes are a function of beliefs. A person who believes that performing a behaviour will mostly lead to positive outcomes will hold a favourable attitude toward performing that behaviour. A person who believes that performing the behaviour will lead to mostly negative outcomes will hold a negative attitude toward that behaviour. These beliefs that underlie the attitude toward the behaviour are termed behavioural beliefs. Subjective norms are also a function of beliefs, but

these are a person's beliefs that certain specific groups or individuals think he should or should not perform the behaviour. These beliefs are termed normative beliefs.

In summary the influences on a person's behaviour include:

- the person's intention to perform the behaviour;
- the person's attitude toward that behaviour;
- the subjective norm, i.e. the person's perception of the social pressures to perform or not perform the behaviour;
- the beliefs underlying the attitude (i.e. that the behaviour leads to certain outcomes and the person's evaluations of these outcomes);
- the beliefs underlying the subjective norm (i.e. that specific individuals or groups think that the person should or should not perform the behaviour).

These link together in the following way in order to explain a particular behaviour (Fig 2.1):-

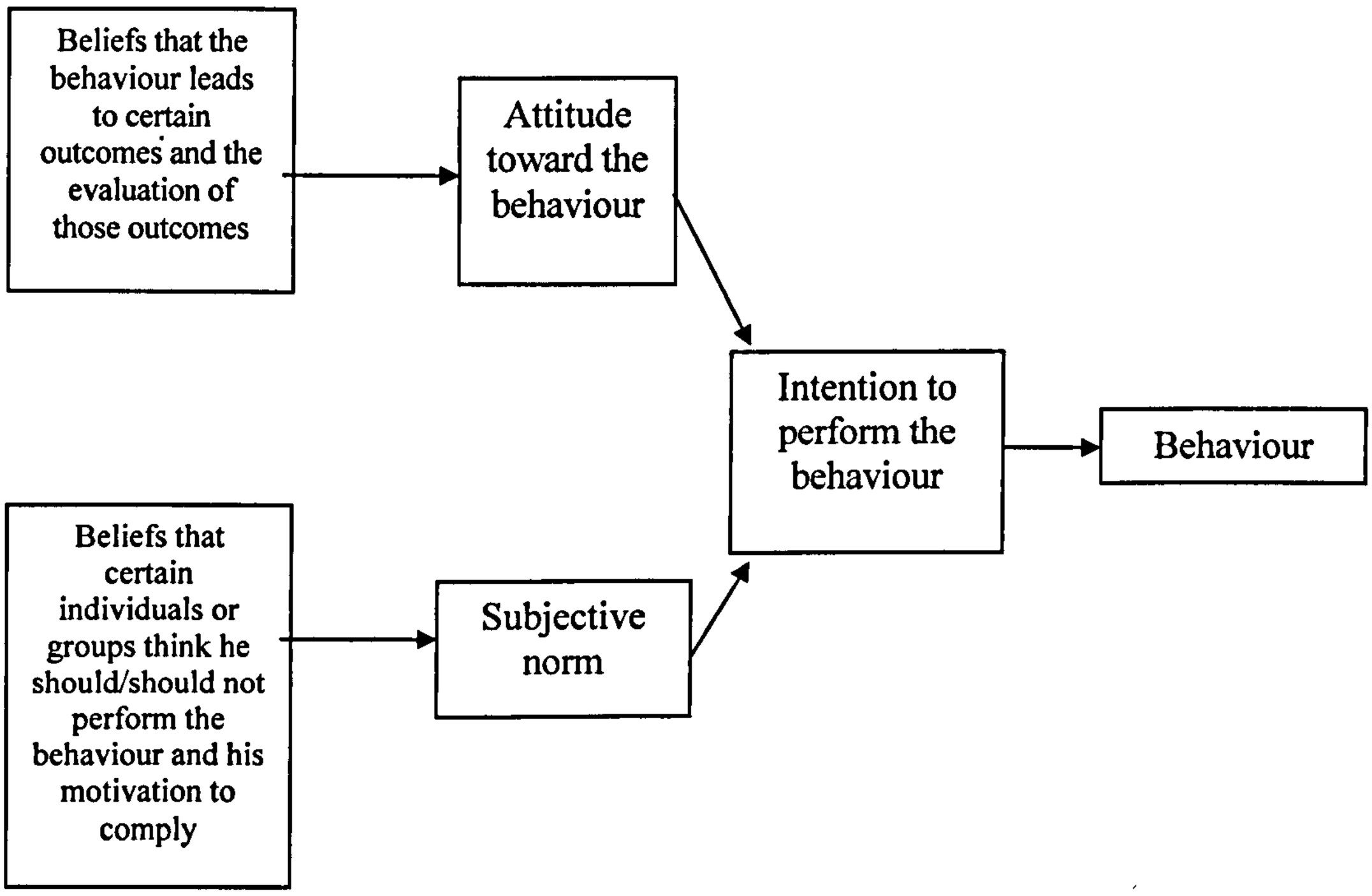


Figure 2.1 The Theory of Reasoned Action - factors determining behaviour.

The model predicts a clear path of influence in order to change behaviour. Since

behaviour change is brought about by beliefs that underlie both attitudes and subjective norms, it is necessary to influence a sufficient number of the underlying beliefs if behaviour is to be changed. The first step towards producing any change is to identify a set of primary beliefs relevant to the behaviour in question. These beliefs can then serve as the basis of the argument in a persuasive communication. Or, alternatively, the persuasive communication can attempt to change the primary beliefs by presenting other arguments relevant to such beliefs. The authors have shown how, using the theory of reasoned action articulated through a persuasive communication, the behaviour of alcoholics can be changed, (Ajzen and Fishbein, 1980: 229). In a similar way to that used in changing the behaviour of alcoholics, this thesis seeks to use the same theory, again through a persuasive communication, to attempt to affect the environmental behaviour of people in a range of contexts. Many other researchers have successfully used the model including Fishbein (1979), Marin, Marin et al (1990), Koballa (1988), Strader and Katz (1990), Crawley and Black (1992), Fishbein and Manfredo (1992 in Manfredo) and Christian and Armitage (2002) in other domains.

It will be shown how the (TRA) meets the criteria suggested in the introduction to this chapter (section 2.1) for a working model for influencing behaviour. Further the TRA gives a strategy which can be used to attempt behaviour change and gives a means by which behaviour can be predicted and influenced and the methods which can be used to influence attitudes towards behaviour. So far there has been little research of its use on influencing attitudes and behaviour towards the environment and conservation. This research offers an original investigation of its potential value.

In this research persuasive communications are used in three different recreational settings to influence visitors. These settings are a botanic garden, a beach, and an archaeological World Heritage Site. The Ajzen and Fishbein model gives a clear path of influence through the persuasive communication which acts on the beliefs underlying the attitudes and behaviour. The model shows that, if the aim of an exhibit is to change behaviour towards nature conservation, the underlying beliefs about that behaviour towards nature conservation must be addressed. Similarly in

changing behaviour towards litter disposal and erosion control the model offers another clear path of influence. By using three different situations the limits of the model and its effectiveness are tested.

2.3 Models of behaviour change in environmental education

In this section traditional models of behaviour change in environmental education are examined to identify their strengths and weaknesses.

2.3.1 The influence of knowledge

Traditional thinking in the field of environmental education has been that we can change behaviour by making human beings more knowledgeable about the environment and its associated issues, i.e. that increased knowledge leads to awareness which leads to positive action. For example:

> 'Increased knowledge leads to favourable attitudes.... which in turn lead to action promoting better environmental quality.'
> (Ramsey and Rickson, 1976 :10)

In contrast to this simple linear model, Lucas (1980) suggests that some authors describe an inter-relationship linking knowledge, attitudes and behaviour, Fig 2.2.

> 'Some authors believe that there is a cyclic relationship between action, attitudes and knowledge, so that attitude changes can be promoted by and promote appropriate actions; environmental knowledge can be developed if appropriate attitudes are present, and attitude change can be stimulated by particular environmental learning'. (Lucas, 1980: 14)

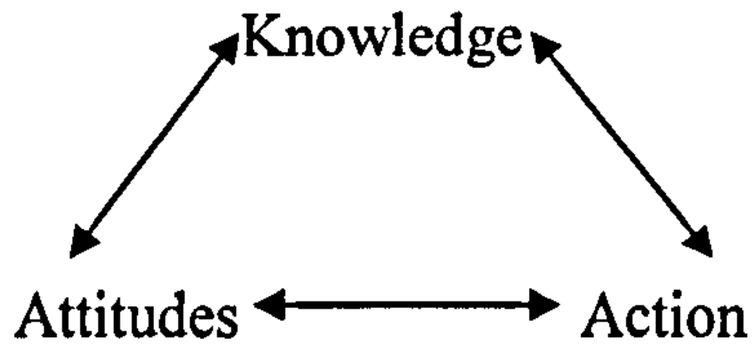


Figure 2.2 The inter-relationship between action, attitudes and knowledge.

However, studies in this area have shown conflicting results. Iozzi (1989) notes that the relationship between environmental knowledge and positive environmental attitudes and values is unclear. Holtz (1976) suggests, from researching programmes run by U.S. nature centres, that mere participation in a cognitively based environmental education programme may not have a significant impact on the attitudes of children. Rather Iozzi concludes that, to change attitudes, specific activities designed to do just that must be included in the programme and that increasing knowledge alone will not significantly change attitudes and values. Other researchers who have come to similar conclusions i.e. that knowledge is not related to attitude are LaHart (1978) in Iozzi, (1989) and Burrus-Bammel (1978). Hendee (1972) on the other hand, believes that environmental educators should not be concentrating on changing attitudes but that closing the knowledge gap will impact on behaviour 'Environmental education should focus on closing the knowledge and participation gap and not closing minds by trying to specify attitudes'.

Conversely several studies have found significant relationships between environmental knowledge and positive environmental attitudes and values. Fortner and Teates (1980) obtained a significant relationship between knowledge of the ocean and attitudes towards marine issues in a study to determine the current levels of marine awareness (knowledge and attitudes) among Virginia's tenth grade students. Stamm and Bowes (1972), Cohen (1973) and Richmond (1978) also reported a significant relationship between knowledge and positive environmental attitudes, although Richmond's survey found a strong relationship between conceptual knowledge and attitudes but a weak relationship between factual knowledge and attitudes.

Similarly, Arcury (1990) found environmental knowledge to be consistently related to environmental attitudes, when he undertook a telephone survey of 680 Kentucky residents, although the relationship was not especially strong. However, overall he found a low level of environmental knowledge which he said has disturbing implications for environmental policy, 'as knowledge and attitudes are assumed to influence environmental policy in America' (Arcury, 1990). He then proceeded to question the causality between environmental knowledge and attitude i.e. that is it is not knowledge which is the causal factor in generating change.

> 'The relatively strong positive correlation of education to both knowledge about the environment and attitude toward the environment does suggest that knowledge leads to attitude.'... 'An equally realistic evaluation is that environmental knowledge and attitude are highly intercausal, and/or they both result from some other factors. In the first instance, knowing something about an environmental issue leads to a change in attitude which in turn leads to further learning about the environment. In the latter instance, a factor such as education or an environmental crisis that expands the individual's general awareness would lead to the knowledge-attitude change sequence.' (Arcury, 1990: 303)

In contrast to Arcury, Iozzi (1989) states that several researchers have noted that it is extremely difficult to change environmental attitudes and values. Alaimo and Doran (1980) found that as students acquired greater knowledge they also acquired a more pessimistic view about the chances of solving environmental problems. Seventh through to tenth grade students had a decreasing perception of the chances for solving environmental problems. However, interestingly Richmond (1978) found from his survey that more negative attitudes were revealed when personal sacrifices were required using an environmental knowledge and attitudes survey.

An increase in knowledge can produce a tension between attitudes and actions

especially if the action needed to improve an environmental condition leads to personal restriction or the loss of jobs. Halfpenny clearly highlighted the nature of this problem in his speech as a trade union official in 1977.

> 'The conflict is greatest for the trade union movement, for it represents employment versus progress....Clearly our society does not need more motor cars, but faced with threat to thousands of jobs the trade union movement lobbied the Government to introduce measures which would in fact lead to the production of more motor cars.' (Halfpenny in Linke (Ed.), 1977:283).

Pursuing the link between knowledge and behaviour, Arcury and Christianson (1993) investigated the rural-urban differences in environmental knowledge and actions. They found that more metropolitan and urban respondents had a stronger environmental world view and were more knowledgeable about global environmental problems. However, they did not differ from non-metropolitan and rural residents in environmental concern *or in environmental actions*. Hence this would suggest that the increased knowledge did not affect actions.

In summary, the descriptive studies described above show a great variation in the possible link between increasing knowledge and a change in attitude let alone action. In some cases knowledge causes a positive attitude, in some cases a negative attitude can result from increased knowledge. These results show that the supposed link between knowledge and attitude can only be applied to the specific study and there is no evidence that they have a more general relevance. Rather the Ajzen & Fishbein model suggests for knowledge to influence attitudes, knowledge needs to influence the beliefs which underlie the attitudes. And then, action will only happen if it is the *attitudes towards the behaviour* that are influenced through the underlying beliefs rather than general attitudes. This could explain why just increasing knowledge has little effect on attitudes or behaviour.

Some studies have looked at the influence of beliefs on action, for instance, Axelrod

and Lehman (1993) investigated *the role of beliefs* in predicting environmentally concerned *behaviour*. The researchers suggest that while individuals may hold strong attitudes on an issue of personal importance, possibly associated with levels of perceived threat, they may not possess (or believe they possess) the knowledge or abilities necessary to act in line with their attitudes. The individual's beliefs about what they *can do* are seen as important determinants of what they *will do*. Constructs such as response efficacy (whether a respondent felt an effective environmentally concerned action existed) and self-efficacy (whether a respondent felt they were capable of engaging in an action) represent individuals' perceptions of the 'ability' to achieve a goal through engaging in a particular behaviour. The authors go on to state that most current theories of social behaviour include some notion of efficacy in their models (e.g. Protection Motivation Theory, Maddux and Rogers, 1983; Theory of Planned Behaviour, Ajzen, 1988). Axelrod and Lehman examined survey data from two samples, undergraduate students and community residents. The main goal of the study was to identify the array of psychological factors that guided behaviours regarding environmental concerns. Nine independent variables were assessed and measured using 6-point Likert scales as follows:-

First, desires related to environmentally concerned behaviour which were defined as:

1. Tangible outcome desires - consisting of two items identifying the importance of personal gain, such as economic savings with respect to environmentally responsible action.
2. Social outcome desires - measuring the extent to which family, friends and community served as a guide to one's behaviour.
3. Principled outcome desires - measuring the extent to which respondents acted in accordance with deeply held values for the environment.

Second, three attitude constructs that included:

1. General attitude - assessing respondents' general beliefs regarding the environment and their evaluations regarding the need for environmental protection.
2. Threat perception - measuring perceived likelihood, severity, and immediacy of environmental problems.
3. Issue importance - measuring the absolute importance of the environment to

the individual as well as its relative importance as compared with other concerns.

Finally, three variables assessing different aspects of efficacy:

1. Response efficacy - assessing whether respondents agreed effective environmentally concerned actions exist.
2. Self-efficacy - measuring whether respondents believed that they have the capability to engage in such actions.
3. Channel efficacy - measuring the perceived difficulty the individual expected to encounter, when attempting to act in environmentally-protective ways.

In general, the findings supported their hypothesis that a multivariate approach to the study of environmentally-concerned behaviour is necessary in order to account fully for differences in environmental action. In the full sample (students and community) six of the nine factors were significant. Two of the outcome desire measures (social and principled) were significant, with desires regarding principled outcomes accounting for the highest amount of explained variance. For the full sample at least two of each of the attitudinal, efficacy, and outcome desire factors were significant predictors of reports of environmentally-concerned behaviour. Desires regarding tangible outcomes were strongly associated with behavioural reports for the community sample, but not for the student sample. Desires regarding principled outcomes were most highly predictive of students' behavioural reports and not at all predictive for the community sample. The authors suggest that interventions aimed at producing environmentally-concerned behaviour should be responsive to potential differences in which of these factors may promote behavioural change. This study shows the importance of the role of beliefs in predicting behaviour. For instance, it suggests that to influence students' behaviour towards the environment, interventions could focus on students deeply held values about the environment shown by the high score for principled outcomes in predicting students' behaviour. But because a wide range of behaviours were used the study does not tackle the specific beliefs underlying the attitudes towards the behaviour. This is due to the behaviour being a general environmentally-concerned behaviour rather than focusing on a more specific environmental behaviour. Also the results from the two samples

differ as the student sample was influenced by different desires than the community sample. It is again an example of a descriptive study where existing beliefs and behaviours were investigated in order to draw information on the links between them. Although it usefully highlights the role of beliefs which need to be influenced by knowledge in order to change behaviour and a multivariate approach to the study of environmentally-concerned behaviour, the results and conclusions show a difference in the two sample populations and are specific to the samples used, with limited use in generalizing to a wider population. The general concept of environmentally concerned behaviour is made up of 24 specific activities related to environmental protection ranging from recycling to attending pro-environmental marches. This does not allow a distinction to be made between any particular value attached to a specific behaviour. This makes it difficult to use the results of the survey to produce a model to guide behaviour change interventions more widely.

2.3.2 Specific interventions

Of more interest to the present study are those studies which attempt to determine the effects of specific interventions on knowledge *and* attitude because these may be more relevant to the research being pursued, which involves a number of specific interventions. These specific interventions include one researched by Gross and Pizzini (1979) who presented a unit designed to prepare students for exploration of a wilderness community. The students engaged in activities exploring concepts and providing knowledge about woodlands and certain environmental problems confronting those woodlands. As a result of that intervention, the researchers found that positive attitudinal change *can* be induced as a result of educational experiences. Moreover the advances achieved as a result of the intervention remained stable after one year. However the researchers did not attempt to investigate whether this would lead to any behavioural changes. Jernigan and Wiersch (1978) reported similar results that an outdoor experience developed positive attitudes towards the environment.

Wilson and Tomera (1980) studied student responses to a three-day series of

activities focusing on a case study and simulation of an environmental problem. On the first day the students were introduced to the basic issue and its associated problem e.g. the pollution of Lake Erie. On the second day the students simulated the differing value positions associated with the issue. In the Lake Erie study students represented participants in a Federal Water Pollution Control Administration hearing on the nutrient pollution problem in Lake Erie. Other positions such as citizens, scientists, government and industry were also represented. On the third day a summary group discussion was held. Wilson and Tomera reported that both case studies and simulations did influence the students' environmental attitude to reflect a more positive environmental concern to the issues raised. Here again, however, there was no attempt to investigate whether the change in attitude led to a change in any behaviour.

In a different type of intervention study undertaken by Burrus-Bammel (1978) attitude was defined as 'the subject's total score for favourable or unfavourable responses to 16 Likert-type statements on a variety of environmental topics', and knowledge as 'the student's total score on 15 true-false items which were formulated to ascertain the participant's environmental conceptual and/or factual information base'. The purpose of this study was to investigate the immediate, intermediate and long-term effect that a week-long environmental education camp would have on the dependent variables of knowledge and attitude. Again no attempt was made to study the effects of this experience on behaviour. The hypotheses to be tested were:

1. The camp would produce a significant change from pre-test to post-test on both the knowledge and attitudes test.
2. The experimental groups would differ significantly between the pre-test and retention test.
3. The control group would vary significantly from the experimental on the retention test.

A written objective test was given at the beginning of the week to determine attitudes, conceptual knowledge, and factual knowledge. The same instrument was

administered at the close of the camp. Twenty-nine young men participated in a one group pre-test, post-test design, with the addition of a post-test only control group to test whether the effect of the camp differed from that of a normal summer week in changing attitude and knowledge. Results showed that there was a significant attitude and knowledge change for the campers and that the post-test of the campers differed significantly from the control group; all three hypotheses were accepted. However, although attitudes and knowledge increased, a linear regression analysis indicated that attitudes were not correlated with knowledge. This finding would tend to support the view that increased knowledge does not necessarily lead to a positive attitude. If the knowledge had been specifically directed at the beliefs underlying the attitudes, and if the knowledge and attitude measures had been of the same target, then a better correlation might have been achieved.

These intervention studies do show that in some cases increased knowledge leads to a positive attitude whereas in other cases it does not. However, most studies reviewed here have not investigated whether the increase in knowledge has *any effect* on behaviour nor have the studies produced a *repeatable* model. Hence, the results of the studies are specific to the study undertaken and a generalizable rule can not be assumed. There is some evidence in the literature reviewed so far that points to some relationship between knowledge and attitude where these are linked by specific scales but there is limited evidence that this subsequently leads on to action.

Although there are good logical reasons to suggest a link between knowledge and action, for without the requisite knowledge no action can be taken, this suggests that knowledge is a necessary but not sufficient condition, which accounts for the conflicting evidence of the link in the literature reviewed here. In the studies reviewed so far it is knowledge that has been influenced rather than beliefs about the behaviour. But the Ajzen and Fishbein model would suggest that this knowledge has to lead to a change in *beliefs about the attitude toward the behaviour* to be effective in behaviour change. Therefore, to change behaviour more than just knowledge about the behaviour is needed. For instance, many people smoke, while they know that smoking causes cancer. However, their attitude toward their own smoking is that

there is little risk for them, or that the benefit (enjoyment of smoking) outweighs the risk. To change their behaviour their beliefs about the effect caused to their own health by smoking need to be changed.

Research by Ajzen and Fishbein (1980) has shown that a person's attitude toward an object (the object in this case being the environment) is a function of his or her salient beliefs that the object has certain attributes and his or her evaluations of these attributes. Following this theory, there is no reason to expect a correlation between a measure of environmental knowledge and environmental attitude using general scales as a measure unless the two instruments used to measure this are closely linked, by reference to the same, specific, 'object'. In the studies reviewed the measures of environmental knowledge and attitude are general measures without a link to a specific object. This could explain the lack of correlation in these studies. For instance, in the study undertaken by Burrus-Bammel (1978), knowledge was measured by 15 true/false items and attitude by favourable/unfavourable responses on 16 Likert type statements on a *variety of environmental topics*. Although both sets of questions included forests as a topic they covered completely different aspects of forest practice and so there was no indication that these two measures were linked to a specific object in any way.

2.3.3 The influence of attitude on behaviour

The literature above has shown descriptions of the attempts to influence attitudes through knowledge and thereby effect actions. However, most of the papers reviewed here did not follow the study through to determine the effect on behaviour. Therefore, the effect of influencing attitude on actions is now reviewed drawing on those few studies that have explored this.

The construct of attitude is not a simple one and in some studies the lack of definition of attitude makes the link between attitudes and behaviour difficult to determine, also research would suggest that influencing attitude by knowledge alone may not be sufficient, feelings and emotions are also important. Eiss and Harbeck

(1969) in Iozzi (1989) for instance, stress the importance of the affective domain, 'the common person does not deal with knowledge alone because knowledge, feelings and emotions are in reality inseparable'.

It is often not clear in the research what aspect of attitude is being measured and whether the measures of attitude and behaviour correspond to the same target. Burrus-Bammel (1978) points out that of eleven papers appearing in the Journal of Environmental Education on the topic of attitudes only two define their term for attitude. In conclusion he quotes Abelson (1972) 'I have severely questioned whether information has any effect upon attitudes and whether attitudes have any effect upon behaviour.'

The problem of defining attitude and its measurement outlined by Burrus-Bammel above is echoed by other writers. For instance, Stern (1992) in a review of psychological dimensions of global environmental change states:

> 'Concern about the environment, as measured by the single-item indicators typically used in public opinion polls, has remained at a high level in the U.S. population for two decades. However, the nature and structure of these attitudes are not yet well understood. It is still unclear, for instance, whether environmental attitudes are one thing or many...Although one of the early general-attitude scales is probably the most frequently used (e.g. Dunlap & Van Liere 1978), no measuring instrument has emerged as standard in the field. The anarchy of measurement reflects theoretical ambiguity about the nature of environmental concern.'(Stern, 1992: 279)

If the simple linear model of Ramsey and Rickson (1976) described earlier in section 2.3.1 is followed, where knowledge leads to awareness which leads to action, then a positive attitude should lead to positive behaviour. However, as stated earlier the direct link between knowledge, the affective domain and behaviour change does not work if the targets of the attitude and the behaviour are different. Later research e.g.

Vining and Ebreo (1992) and Scott and Willits (1994) also does not bear out the validity of these linear models based on increased knowledge resulting in a change in attitudes and a change in behaviour.

Scott and Willits investigated the attitudes and behaviour towards the environment of Pennsylvanians by using a measure of environmental attitude developed by Dunlap and Van Liere (1978) which embraces the new environmental paradigm (N.E.P.). Dunlap and Van Liere recognised a new world view was emerging which contained ideas such as 'limits to growth', the importance of preserving the 'balance of nature'. Taken together the ideas comprised a world view captured by the 'space ship Earth' metaphor. They termed this new world view the 'New Environmental Paradigm'. The N.E.P. has the central idea of maintaining the balance of nature as an end in itself or as a spiritual value. Other aspects include a belief in the limits to growth, the necessity of balancing economic growth with environmental protection, and the need for humans to live in harmony with nature. Respondents were asked to indicate whether they strongly agreed, agreed, were undecided, disagreed, or strongly disagreed with each item e.g.

'The balance of nature is delicate and easily upset.'

'Humans must live in harmony with nature to survive.'

Dunlap and Van Liere (1978: 13)

Environmental behaviour was assessed using 10 items devised by Maloney, Ward and Braucht (1975). Respondents were asked whether each item was true or false in terms of their own behaviour e.g.

'I have switched products for ecological reasons.' or

'I have never written a congressman concerning pollution problems.'

A principal components analysis yielded two factors; one dealing with 'consumer behaviours' and the other focusing on 'political behaviours'. The results showed that 'Pennsylvanians expressed a high degree of concern toward the environment but

engaged in few ecologically oriented behaviours... *The relationships between attitude and behaviour measures were modest'*, (emphasis added).

There are a number of factors which explain this result.

> 'One explanation for a weak attitude-behaviour relationship is that researchers may have erroneously assumed that specific behaviours are valid indexes of a given attitude or that a cluster of attitudes leads to or implies the expression of specific behaviours.' They continue 'although we sought to obtain multifaceted indexes that would reflect overall patterns of relevant feelings and actions, the range of items may have been too narrow to provide measures that were as general as desired.' (Scott & Willits, 1994:254).

That is the authors have used different measures for attitude and behaviour and have not clearly defined what attitude they are measuring. There does not, therefore, appear to be a strong correspondence between attitudinal and behavioural entities in terms of target, context, action and time elements which Ajzen and Fishbein advise in their theory of reasoned action. The attitude is measured as a general measure rather than as a measure of the attitude towards the behaviour, so the weak attitude-behaviour relationship is not surprising.

The importance of promoting pro-environmental behaviour has stimulated many studies to investigate the influence of attitude on environmental behaviour. For instance, in a study to determine actual behavioural involvement in pollution-abating activities Kronus and Van Es (1976) analyzed the effect of situational factors, such as environmental quality, and attitudes on behaviour. Their study was based on a community in which effects of economically beneficial farm practices were perceived as creating an urban pollution problem. The purpose of the study was to analyse the effects of situational factors such as residential location and life cycle conditions, along with attitude toward environmental quality, in understanding why some people become involved in pollution-abating activities while others did not. Two groups were compared, urban men and farmers. Concern about local

environmental pollution was the clearest motivating influence which was equally powerful among farmers and urban men. Those men who were very concerned about their environment had modified their home consumption practices to minimize pollution. However, they found that 'reducing pollution by appeals to voluntarism (the degree to which a person prefers to rely on personal responsibility rather than government regulation) was doomed, for those who defended voluntarism were not the ones improving their household behavior'. Although those people who had a positive attitude to the environment were practising environmentally responsible behaviour, changing the behaviour of those men who did not have a positive environmental attitude was more difficult because they were not prepared to do it voluntarily. The authors suggest that in some cases power and legalistic strategies are needed rather than relying on voluntary participation to improve the environment. However, they made no attempt to influence attitude and behaviour in this study, rather drawing their conclusions from the results of their telephone interviews and concluding: 'Attempts to change attitudes and values by appealing for co-operation will generally reach only those who are already concerned and thus will not change anyone's values.' In contrast the work of Ajzen and Fishbein (1980) using persuasive communication and the theory of reasoned action suggests that it *is* possible to change attitudes and behaviour if the attempt acts on the beliefs underlying the attitudes towards the behaviour.

In a similar way, the promotion of recycling behaviour and what factors influence a person to recycle has been investigated. Arbuthnot (1977) explored the difference in characteristics between recyclers and non-recyclers concluding that

> 'The fact that personality and attitudes are also predictive of recycling behavior indicates that the content of public education programs and appeals for pro-environmental actions on the part of the general populace need to be differently tailored to meet the needs and concerns of differing potential target groups.'(Arbuthnot, 1977: 231)

Essentially Arbuthnot has been able to show the differences between the people

carrying out recycling and the non-recyclers but has not really indicated how the non-recyclers might be influenced to carry out recycling.

Likewise, Granzin and Olsen (1991) investigated factors which predicted environmental behaviour. They characterized participants in three related environmental protection activities; donating items for re-use; recycling newspapers; and walking when possible for reasons of conservation and environmental concern. Their findings indicated that demographic, media usage patterns, information sources, and knowledge provided modest understanding of the undertaking of activities protecting the environment. A new area, that of 'helping behaviour', was explored where a helper decides to provide assistance to a needful recipient. In the context of environmental protection, individual citizens were viewed as potential helpers and the environment and society as the recipients of helping behaviour. Participation in environmental protection activities could be better understood in terms of personal values and when aspects of helping behaviour of the participants, were considered. This study by Granzin and Olsen does describe factors which are relevant for three particular actions such as donating items for re-use. Hence, they have been specific about the environmental behaviour they were seeking. Nevertheless, on the other hand they have not used these results to try to influence and change behaviour. Also the results may only be valid to the particular sample used (340 adults in a major western metropolitan area) and it is possible that a different sample, for instance students or rural respondents, would have different factors that predicted the action. The study would yield more information if the results were applied and tested to a different situation. Possibly, if Granzin and Olsen had carried out a study including many more different environmental actions, and the relevant factors for each action corresponded, then these factors might be more generalizable to other situations which, in turn, would help to draw up a model to show how to influence environmental behaviour.

The next two studies show how predictive investigations can give indications as to some of the factors needing to be considered when studying behaviour change. Oskamp et al (1991) get closer to linking attitudes and behaviour when they

investigated factors influencing household recycling behaviour and found that the main significant predictors of kerbside recycling were a few demographic variables, attitudes and behaviour variables that pertained specifically to recycling. General pro-environmental attitudes did not predict kerbside recycling behaviour, but attitudes specific to recycling did. They suggested that campaigns to promote recycling needed to concentrate specifically on awareness of, and favourability to, recycling rather than general environmental consciousness. This finding of high attitude–behaviour relationships when the level of specificity is comparable parallels similar findings from other areas of study (e.g. Koballa, 1988) and supports the Ajzen and Fishbein TRA.

Howenstine (1993) on the other hand, studied the perceptions, opinions and behaviours of members of 578 households in Chicago with respect to recycling. From this he proposed that changing recycling behaviour had requirements of motivation (the main motivation indicators were 'never thought about it' and 'don't care'), information and overcoming inconvenience. Nevertheless, he did not describe exactly how this could be done or carry out an investigation based on these findings. However, Howenstine has undertaken a more useful study for our purposes in tackling the requirements to change behaviour, because he proposed how behaviour with respect to recycling can be *changed* rather than for example, comparing the characteristics of recyclers and non-recyclers, (Arbuthnot, 1977). Essentially Howenstine has proposed requirements which are needed to change behaviour e.g. information, overcoming the inconvenience and changing motivation, which could be investigated by other researchers trying to change behaviour towards recycling. His requirement of changing motivation could be thought of as similar to the attitude toward the behaviour mirroring part of the Ajzen and Fishbein model i.e. that the behaviour is influenced by the attitude toward the behaviour and also lend support to the Ajzen and Fishbein model of behaviour change.

While Howenstine looked at the effect of attitudes on behaviour Vining and Ebreo take a contrasting behavioural approach and examine the effects of behaviour on attitudes. Vining and Ebreo (1992) conducted a study of differences in broad and

specific environmental attitudes before and after a recycling programme was implemented. Their study is an interesting one because again it actually involves an attempt to change behaviour. Surveys of households were conducted at three different times to investigate changes in general environmental concern, specific recycling attitudes and recycling behaviour that occurred as recycling opportunities increased over time. After the initial data point, a voluntary kerbside recycling program was implemented in central sections of the community and then later expanded citywide. The effectiveness of the kerbside recycling program in encouraging recycling behaviour was striking. Self-reported recycling frequencies as well as actual recycling volume indicated that the kerbside program was highly successful in enlisting greater co-operation among recyclers and in converting non-recyclers to recyclers. However, the link between attitudes and behaviour of recyclers and non-recyclers was not found to be strong.

> 'Evidence from the role played by attitudinal precursors in this behaviour change was provided by differences between recyclers and non recyclers, changes in attitudes over time, and in the regression model, which provided an indication of the strength of the attitude-behaviour relationship. Although we hypothesized that there would be no difference in recyclers' and non recyclers' global environmental attitudes..., we found that recyclers' global environmental attitudes were stronger than those of non recyclers. As hypothesised, recyclers' specific recycling attitudes were stronger than those of non recyclers.... Recyclers perceived somewhat greater social pressure to recycle and were more likely to feel a personal obligation to recycle.' (Vining & Ebreo, 1992:1603)

In conclusion, the study did show a link between the specific recycling attitudes and behaviour of the recyclers but the non-recyclers also had positive attitudes towards recycling. The results demonstrate that setting up the programme caused more recycling behaviour to take place but *did not show why* nor how to encourage the non-recyclers to recycle. It showed that it does not follow that if you have a

favourable attitude towards recycling you will necessarily recycle, as non-recyclers also had favourable attitudes. It was the setting up of the program that had more effect than attitudes. However, the authors did show a link between specific recycling attitudes and behaviour which supports the Ajzen and Fishbein TRA model in that a change in behaviour is supported by a change in the attitude towards the behaviour.

Further insight into the relationship between attitude or affect (feelings) about the environment, knowledge and environmental action, is provided by the work of Borden and Schettino (1979). They found that environmental knowledge was not related to environmental affect (the degree of emotionality related to environmental issues or feelings about environmental issues e.g. 'it frightens me to think that much of the food I eat is contaminated with pesticides'), but affect was a more important determinant of current commitment (behaviour) than level of knowledge. Futuristic (verbal) commitment (actions he or she would be willing to carry out) was found to be almost exclusively a function of environmental affect. Thus, from this study it would appear that affect or attitude is more important than knowledge.

In their research Borden and Schettino used a 128-item ecology test, developed by Maloney and Ward (1973 & 1975) and a large sample of more than 500 individuals. The test was composed of four subscales, 2 subscales corresponded to affect and knowledge, and 2 subscales to measure behavioural variables: a) actual commitment - behaviours in which the individual is currently engaged, such as recycling waste or changing products for ecological reasons, and b) 31 futuristic probabilistic items of verbal commitment that a person states he will be willing to do, such as willingness to purchase only recyclable beverage containers. The study was designed to test the assumption that factual knowledge and feelings about environmental issues are independent variables. If these were found to be independent, the design allowed the researchers to check the relative contribution of each in producing environmentally responsible action. There was no significant correlation between the affect and knowledge scales ($r = 0.01$, d.f. = 528; Pearson product moment correlation). In view of this finding the two variables were utilized as independent variables in an analysis

of variance design which examined their additive and interactive effects upon Actual Commitment and future Verbal Commitment. The two factors were observed to combine additively in producing the current level of environmentally responsible action shown by an individual. In terms of future commitment this was a function of environmental affect but not environmental knowledge i.e. environmentally responsible behaviour was influenced by attitude but not knowledge. Borden and Schettino felt that both affective and cognitive experiences are involved in developing the highest level of environmentally responsible action. However, the study did not look at the effects of affective versus cognitive teaching strategies which needs further research. Again, this study investigates the contribution to environmental attitudes of affective, cognitive and behavioural components but does not take this further to attempt a behaviour change. To correlate a variable in a specific study to a measure of environmental concern does not indicate that it can be generalized to other studies. Perhaps, more importantly it does not provide a general model from which to work on influencing behaviour change. Once again the results of this study are specific to the particular study and it is difficult to generalize to suggest a model to influence behaviour change from a descriptive study of this type. As valuable as this study is the findings lacked any generalizable model which could be extended to other realms of action. The study therefore adds little more to our understanding.

These studies give an indication of the links, in some cases but not others, between attitudes and behaviour but no general pattern has emerged from which a model of behaviour change can be drawn. The lack of link between attitudes and behaviour in many studies is again due to the targets of attitudes and the targets of behaviour being different. For instance, in Scott and Willit's (1994) study the targets of behaviour were consumer products and political behaviour whereas the targets of attitude were global environmental attitudes. Often different measures are used for attitude and behaviour making links between the two unlikely.

Ajzen and Fishbein (1977) have examined the relation between attitude and behaviour in the light of the correspondence between attitudinal and behavioural

entities. Such entities are defined by their *target*, *action*, *context* and *time* elements. That is a given action is always performed with respect to a given target in a given context and at a given point in time. For instance the behaviour might be the act of buying a particular video game on a Saturday. The corresponding attitude would be the attitude towards buying the particular video game on a Saturday. Their review of available empirical research supports the contention that strong attitude-behaviour relations are obtained only under high correspondence between at least the *target* and *action* elements of the attitudinal and behavioural entities. For instance the act of voting for a candidate or issue in the United States of America reflects the voter's evaluation of the candidate or issue under question. A measure of attitude towards the candidate would expect to correlate highly with voting behaviour. (However Ajzen and Fishbein note that the most appropriate predictor is the attitude towards the action rather than the attitude towards the target.)

One problem in the studies reviewed so far is that the measures of attitude have tended to be towards general environmental actions whereas the measures of behaviour have been specific actions e.g. recycling. So the attitudes measured have been different from the specific behaviour or target of that behaviour and the scales used to measure the attitude and behaviour have differed. As the attitude and behaviour measures differ, this would account for the lack of attitude behaviour links and no common pattern emerging from which a model can be drawn. Ajzen and Fishbein maintain that the attitude measured should be toward the behaviour.

In conclusion, Ajzen and Fishbein would predict that it was unlikely these studies would then find a strong attitude-behaviour relationship unless the attitudinal and behavioural entities corresponded in at least target and action elements i.e. the target of the attitude and the action must correspond. Where the scales used in the studies to measure attitude and those used to measure behaviour differ in their targets it is simply not surprising there is no correlation.

2.3.4 Towards a definition of the attitude concept

From the previous discussion, it can be seen that often the measure of attitude is not clearly defined. In the context of this study two areas of the definition of attitude are specifically relevant. Firstly, how does one define attitude and therefore measure it? Secondly, how is attitude influenced or formed? Here, some of the definitions which have been used in studies of the attitude concept are reviewed revealing the variety of different approaches taken. Then the definition used for this research is described and approaches to influencing attitude are reviewed.

Attitude is a vague and ambiguous term, described in different ways by different authors. White (1988) writes of attitude as easier to experience or demonstrate than define. The definition of attitude seems to vary depending on the study being undertaken. Indeed some authors do not make clear what they mean by the term attitude. For example Gardner (1995) examines and critiques papers which measure attitude without defining the common construct. He also criticises researchers who identify a set of underlying constructs, write items reflecting these constructs, and then add up all the item scores into a grand total score. Gardner describes this as the "dining room table analogy".

> 'The length, weight and reflectivity of a dining room table can each be measured meaningfully, but adding these three variables together to form a "Dining Room Table Index" yields a meaningless uninterpretable variable.' (Gardner, 1995: 284)

Definitions of attitude have changed through time. Ajzen and Fishbein (1980) review the historical development of the attitude concept and its link with behaviour. They describe a wide variation in the use and meaning of attitude from a state of mind to a process determining a person's actions. Ajzen and Fishbein describe one of the earliest definitions of attitude as being mentalistic: Herbert Spencer, (1862 in Ajzen and Fishbein, 1980), argued that: -

> 'Arriving at correct judgements on disputed questions, much depends on the attitude of mind we preserve while listening to, or taking part in, the controversy.'

This was later supplemented by the concept of motor attitude, and by 1901, attitude was defined as:

> 'readiness for attention or action of a definite sort', (Baldwin, 1901 in Ajzen and Fishbein, 1980).

The first use of the attitude concept to explain social behaviour was by Thomas and Zaniecki (1918 in Ajzen and Fishbein, 1980) who viewed attitudes as individual mental processes that determine a person's actual and potential responses. This was quite a restricted uni-dimensional view of attitude failing to take into account the feelings or 'affect' side of attitude.

In contrast, Allport (1954 in Warren and Jahoda, 1973) argued strongly for the recognition of the qualitative nature of attitudes. Criticising the notion that attitude could be measured by a single score which represented how favourable or unfavourable a person was to a given attitude object, Allport, in making his critique, reviewed the multitude of definitions that had been proposed by other theorists. He described an alternative view of attitude as:

> 'An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related.'

Nevertheless, Allport argued that the evaluative dimension alone could not capture the complexity of the attitude concept. This then led to many of the more recent, 1950s onwards, definitions of attitude which comprise three components: i) the cognitive, what the person believes about the attitude object; ii) the affective, what a

person feels about the attitude object i.e. how favourably or unfavourably it is evaluated; and iii) the behavioural, how a person responds to the attitude object, (see Fig 2.3). This multi-component view of attitude was adopted almost universally by the 1950s in response to criticism that the uni-dimensional view did not do justice to the complexity of the attitude concept.

From this perspective, attitudes were viewed as complex systems comprising the person's beliefs about an object, his feelings towards the object, and his action tendencies with respect to the object.

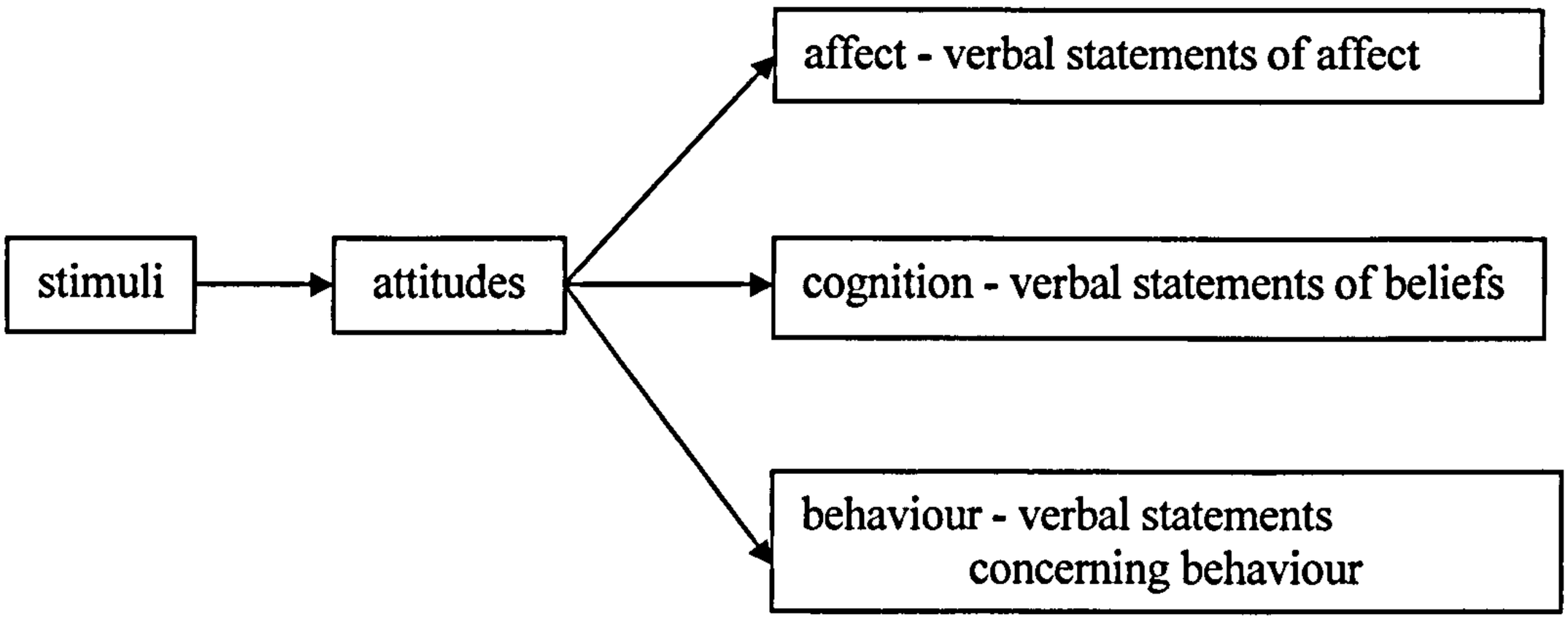


Figure 2.3 The three-component view of attitude, Rosenberg and Hovland (1960).

The implication from this definition of attitude is that a complete description requires that all three components be assessed by obtaining measures of all three response categories. Measures of attitude based on only one or two response classes are considered incomplete under this definition. However, when it came to measuring attitudes the scales used by researchers in the 1950s all tapped only the affective component and independent measures of conative and cognitive components were not developed.

Other definitions of attitude have concentrated on the link between attitude and behaviour. In a discussion of 'attitude as a scientific concept' DeFleur and Westie (1963) state that there are two general conceptions of attitude in the then current literature, probability conceptions and latent process conceptions. In probability conceptions attitudes are equated with the probability of a certain response when

faced with a particular stimulus. The latent process conception describes attitude as an intervening variable between stimulus and response. The primary difference between them is that different inferences are made about attitude from the behaviour referent. DeFleur and Westie are proposing here another uni-dimensional view of attitude where attitude is inferred from behaviour and does not include affective or cognitive components.

> 'The primary inference implied in probability conceptions is that attitudinal responses are more or less consistent. That is a series of responses toward a given attitudinal stimulus is likely to show some degree of organisation, structure or predictability. Responses of a specified type, say verbal rejection behaviour, may be more likely to occur than, say, acceptance or indifference responses for a given individual when he is confronted repeatedly with a defined attitude stimulus. Such a response organization can be termed a negative attitude. Attitude is equated with the probability of recurrence of behavior forms of a given type or direction.' (DeFleur and Westie (1963), in Warren and Jahoda 1973: 168)

In the probability conception the attitude is not defined in itself but implied from the ensuing behaviour response to a stimulus. The latent process view goes a step beyond the response consistency 'and postulates the operation of some hidden or hypothetical variable, functioning within the behaving individual, which shapes, acts upon or 'mediates' the observable behaviour'.

> 'The observable organization of behaviour is said to be 'due to' or can be explained by the action of some mediating *latent variable*. The attitude, then, is not the manifest responses themselves, or their probability, but an intervening variable operating between stimulus and response and inferred from overt behaviour. This inner process is seen as giving both direction and consistency to the person's responses.' (DeFleur and Westie in Warren and Jahoda, 1973 :168)

That is, attitude is the hidden variable between the stimulus and the behaviour.

Both these conceptions form a strong link between attitude and behaviour but *do not* clearly show the *distinction* between attitude and behaviour. Indeed the attitude is measured or inferred from the resulting behaviour in the probability conception. The latent process view does not define the attitude, as such, but places it as a link between stimulus and response behaviour. Attitude is not therefore clearly defined in its own right and how measurement would take place of such an attitude from these definitions is not clear.

A more promising line in defining attitude, because it links attitudes to their objects, was developed by Wicker (1969) in his review of studies of attitude-behaviour relations. He described attitudes following Insko and Schopler's definition as

> 'evaluative feelings of pro or con, favourable or unfavourable, with regard to particular objects'; the objects may be 'concrete representations of things or actions, or abstract concepts' (Insko and Schopler, 1967, in Warren and Jahoda 1973 :167).

Wicker makes no distinction between affective and cognitive components of attitude because he states that both are tapped by verbal measures, and often questions about feelings and beliefs are included in the same attitude scale. Clearly with such differences in definition of attitude any investigation needs to be clear on what is actually being measured in terms of attitude.

Wicker made a study of attitude-behaviour relationships, investigating studies which met the following criteria:-

- The unit of observation had to be the individual rather than a group.
- At least one attitudinal measure and one overt behavioural measure toward the same object had to be obtained for each subject.

- The attitude and behaviour had to be measured on separate occasions.
- The overt behavioural response had to be not merely the subject's retrospective verbal report of his own behaviour.

He found from the 47 studies taken as a whole, that it was more likely that the attitudes would be unrelated or only slightly related to overt behaviours than that attitudes would be closely related to actions.

However, the theory of reasoned action described by Ajzen and Fishbein (1980) can explain why Wicker found so little relation between attitudes and behaviours. Contrary to Wicker's view they suggest that appropriate measures of attitude are strongly related to action. Prediction of a single behaviour can only be assessed by a person's attitude toward that particular behaviour. The inconsistencies shown by Wicker's studies on attitude behaviour links can largely be explained by the lack of correspondence between the targets of the attitude and behaviour. The attitude behaviour link is only strong if we investigate the attitude towards the behaviour not the attitude towards some target the behaviour is directed towards i.e.

> 'any behavioural criterion can be predicted from attitude - be it a single action or pattern of behaviour - provided that the measure of attitude corresponds to the measure of behaviour' (Ajzen and Fishbein, 1980:27).

From the studies mentioned so far it is clear that definitions of attitude can vary from evaluative feelings of 'pro' or 'con' with regard to particular objects, to a multi-component view encompassing affect, cognition and behaviour. A multi-component definition will include behavioural measurement as well as attitude measurement, in which case it is difficult to define where the line between measuring attitude and measuring behaviour lies. Also with a multi-component view it is difficult to produce a single measure. The more useful definition for the purposes of this study is the evaluative one taking the uni-dimensional view of attitude i.e. a feeling of favourableness or unfavourableness towards an object because this distinguishes

attitudes from beliefs, values and behaviours and enables measurement to be made of a distinct construct. A multi-dimensional view, on the other hand, would include a behavioural component. This does not allow for measurement of a single aspect to be made. However, when attempting to influence or change behaviour the target of the attitude is all-important. Studies where attitudes have had general targets have shown no correlations between attitude and behaviour measures. The measure of attitude must correspond with the measure of behaviour. To predict a behaviour the person's attitude toward the behaviour needs to be assessed not the attitude toward a general target. The attitude must be focused towards the behaviour required, so the attitude becomes the feeling of favourableness, or unfavourableness, towards the particular behaviour being undertaken. This is the definition and conception of attitude to be used in this research.

This review shows that there are wide variations in definitions of attitude and the important aspect for any particular study is to clearly define the constructs which are being used particularly when measuring an attitude.

2.3.5 Attitude formation

Fishbein and Ajzen (1975) review theories of attitude formation and compare them under 4 headings; learning theories, expectancy-value theories, consistency theories and attribution theories. Fishbein and Ajzen describe the differences in these theories in terms of: 1) the variables that play a central role in the theory; 2) the ways that variables are interrelated; and 3) the processes of formation and or change of the variables.

Information can have an effect on attitude formation in two different ways: - some theories postulate an *information* processing model;

> 'information about an object or issue or about one's self leads to the formation of beliefs or attitudes. Other theories postulate a *dynamic*

> process where information affects beliefs or attitudes only to the extent that it introduces some inconsistency or instability among these variables.' (Fishbein & Ajzen, 1975: 50).

They suggest that virtually every theory of attitude formation is in some way concerned with information. The information may be about an object or about one's own beliefs, attitudes, intentions or behaviours with respect to the object. Both types of information may be gained either through direct observation or by means of some communication. Theories which are based on notions of information processing deal directly with processes of attitude formation and, therefore, have immediate implications for change. These include various learning theories and expectancy value models dealing with the effects of information on attitude, whereas attribution theories are concerned with information's effect on beliefs e.g. Bem (1967) see section 2.5. Dynamic theories, however, tend to focus on change e.g. Festinger's theory of dissonance (1962) see section 2.5. According to the work of Ajzen and Fishbein attitude is influenced by beliefs; and information has an important part in influencing these beliefs. However, it has been shown earlier in this thesis that just presenting information does not change behaviour: the information has to act on beliefs which, in turn, have to act on the attitude towards the behaviour.

Katz (1960), in contrast, proposed four attitude functions: utilitarian, ego-defensive, value-expressive, and knowledge. He stated that the reasons for holding or changing attitudes are found in the functions they perform for the individual. The conditions necessary to arouse or modify an attitude vary according to the motivational basis of the attitude. The utilitarian function is represented by attitudes which help people maximise rewards and minimise punishments. These attitudes can be changed by, for instance, creating a new reward scheme (which a company might do to incentivise its employees). Attitudes with an ego-defensive function serve to defend one's self image. For example a person holding a prejudice against a minority group would probably be doing this to bolster their own self-image. Katz suggests the way to influence this attitude is to remove the threat to ego (and thereby remove the need for self-defence). Value expressive attitudes are aroused by cues associated with an

individual's values and by the need to reassert his or her self image, and can be changed by showing the appropriateness of the new or modified beliefs to the self concept. The knowledge function of attitudes reflects the role of attitudes in organizing and understanding information and events. Katz acknowledges the function of beliefs in attitudes: 'Attempts to change attitudes can be directed at primarily the belief component or at the feeling, or affective, component.' He describes the persuasion mechanisms which could be used to change attitudes by suggesting means of influence tailored to each functional attitude type e.g. changing the utilitarian attitude by introducing a reward scheme. The problem with this approach is that there are many other functional attitudes which presumably each need their own method of persuasion so there is no universal rule or model which can be derived from this functional approach to act as a model in changing attitudes and behaviour. Although there are a number of different attitude functions described by different researchers e.g. Shavitt (1990), Gastil (1992) both cited in O'Keefe (2002) there is no complete listing of all known attitude functions and the lack of consensus between researchers makes generalization difficult. However, the use of information in changing beliefs and attitudes is still pertinent to Katz's approach to attitude function.

Petty and Cacioppo (1986) define attitudes as general evaluations people hold in regard to themselves, other people, objects and issues. They state that:

'A person's general evaluations or attitudes can be based on a variety of behavioural, affective and cognitive experiences and are capable of guiding behavioral, affective, and cognitive processes. Thus, a person may come to like a new political candidate because she just donated $100 dollars to the campaign (behavior-initiated change), because the theme music in a recently heard commercial induced a general pleasantness (affect-initiated change), or because the person was impressed with the candidate's issue positions (cognitive-initiated change).' (Petty & Cacioppo 1986: 5)

Petty and Cacioppo have proposed a general theory of attitude change called the Elaboration Likelihood Model (ELM). The ELM began through attempts to account for differential persistence of communication-induced attitude change. They postulate that there are two distinct routes to persuasion. The first type (the central route) occurs as a result of a person's careful and thoughtful consideration of the true merits of the information presented in support of an advocacy. The second type (the peripheral route) occurs as a result of some simple cue in the persuasion context (e.g. an attractive source) that induced change without necessitating scrutiny of the information presented. Petty and Cacioppo maintain that attitude change achieved by the central route is likely to be relatively enduring.

2.3.6 Descriptive models of environmental behaviour

Moving on from the influence of attitude on behaviour change to investigate behaviour itself; within the research papers reviewed here are models of behaviour, where authors have attempted to describe which factors influence behaviour in a particular area. Consequently these models are reviewed here because a model drawn from these studies may be repeatable and form a basis for a study attempting to change behaviour.

Hines et al. (1986-87), analysed 128 studies and constructed a model of responsible environmental behaviour. This is an important meta-analysis of the behaviour research literature in environmental education (EE) because of the large number of studies on which it is based. Hines et al. bemoaned the lack of knowledge of factors which have a formative effect on the development of environmentally responsible behaviour. They acknowledged the huge amount of research in environmental behaviour in a wide variety of fields where a tremendous variety of variables have been investigated. But they noted the lack of agreement among researchers as to the variables most strongly associated with responsible environmental behaviour. Their meta-analysis came up with the following information on variables.

'The following variables were found to be associated with responsible

environmental behaviour: knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment, and an individual's sense of responsibility.' (Hines et al, 1986: 1)

Their model of predictors of environmental behaviour was proposed as follows, Fig 2.4.

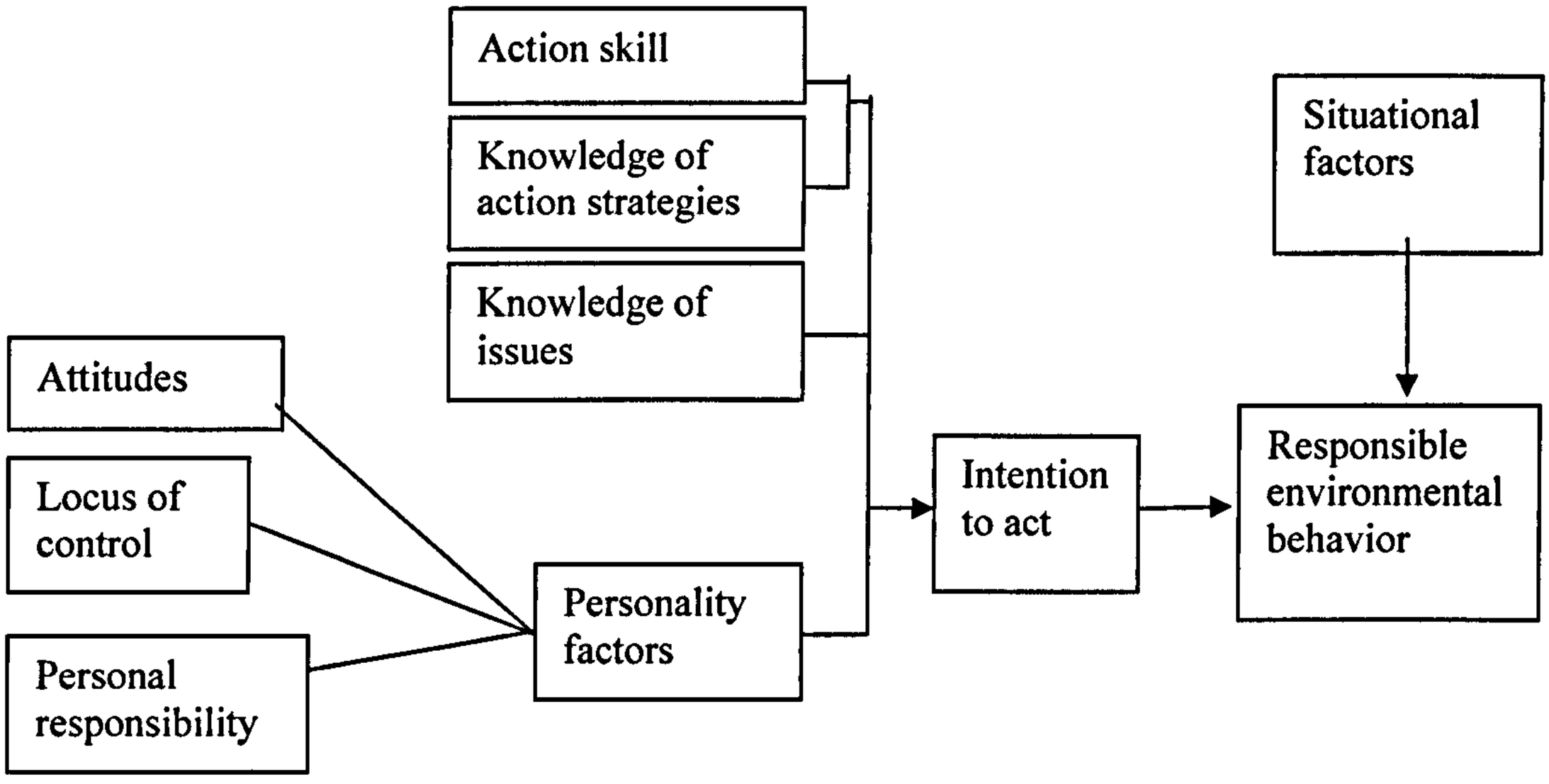


Figure 2.4 Hines et al model of predictors of environmental behaviour (1986: 7).

The authors acknowledged the complexity of the model and the uncertainty of predicting environmentally responsible behaviour due partly to the inclusion of situational factors which are ever changing. They concluded that:

'Additional research is needed in an effort to discover those interrelationships which exist between each of the variables in the model.' (Hines et al., 1986: 8)

The model, although complex, has many interesting links. The intention to act coming before responsible environmental behaviour is a logical progression and bears similarities to the Ajzen and Fishbein Theory of Reasoned Action (1980) in that this theory links the behaviour of a person to the intention to perform that

behaviour as the best possible predictor of that behaviour. However, Hines at al. consider this *intention to act* is an artefact of a number of other variables. They feel that before an individual can intentionally act they must have knowledge of the environmental problem and knowledge of the courses of action. Within the Hines model, the desire to act is also influenced by personality factors. This means that, in order to use the model to effect responsible environmental behaviour, the personality of each individual needs to be taken into account. And then the desire to act is affected by a host of personality factors. These include locus of control, attitudes and personal responsibility. The Hines model differs from the Ajzen and Fishbein model in this respect as Ajzen and Fishbein are very clear that it is the attitude toward the behaviour that is the important factor rather than attitude as a facet of personality or general attitude toward the environment. This aspect of the Hines model needs to be more clearly defined to know how a person can be influenced through their attitudes, as a personality factor may not be possible to influence, but an attitude toward a particular behaviour may be subject to influence.

The strong influence of situational factors such as economic constraints and social pressures in the Hines model makes the model particularly complex to implement. Although the model proposed by Hines et al includes many of the elements of the Theory of Reasoned Action, (Ajzen and Fishbein, 1980) it does not include a pathway for predicting environmentally responsible behaviour. The model does not indicate whether all the factors have a similar importance or whether some have more effect on behaviour than others. In practice it is probable that some of the factors have a stronger influence on the responsible environmental behaviour than others. Hines et al suggest that the model shows several areas which are amenable to change by environmental educators especially the knowledge and skills components, and perhaps the personality components. They suggest approaches which address both affective and cognitive factors. However, it is not known how the personality and situational factors may affect these influences. It would be difficult to apply this model to a situation to change behaviour because of the large number of variables needed to influence the environmentally responsible behaviour and the lack of information on the relative importance on the different variables. Therefore this

model, at least in its present form, is not one upon which a study of influencing attitudes and behaviours to nature conservation can be based.

Hungerford and Volk (1990) have proposed three further categories that contribute to behaviour: entry-level variables; ownership variables; and empowerment variables, which are hypothesized to act in a more or less linear fashion, as shown below Fig 2.5:-

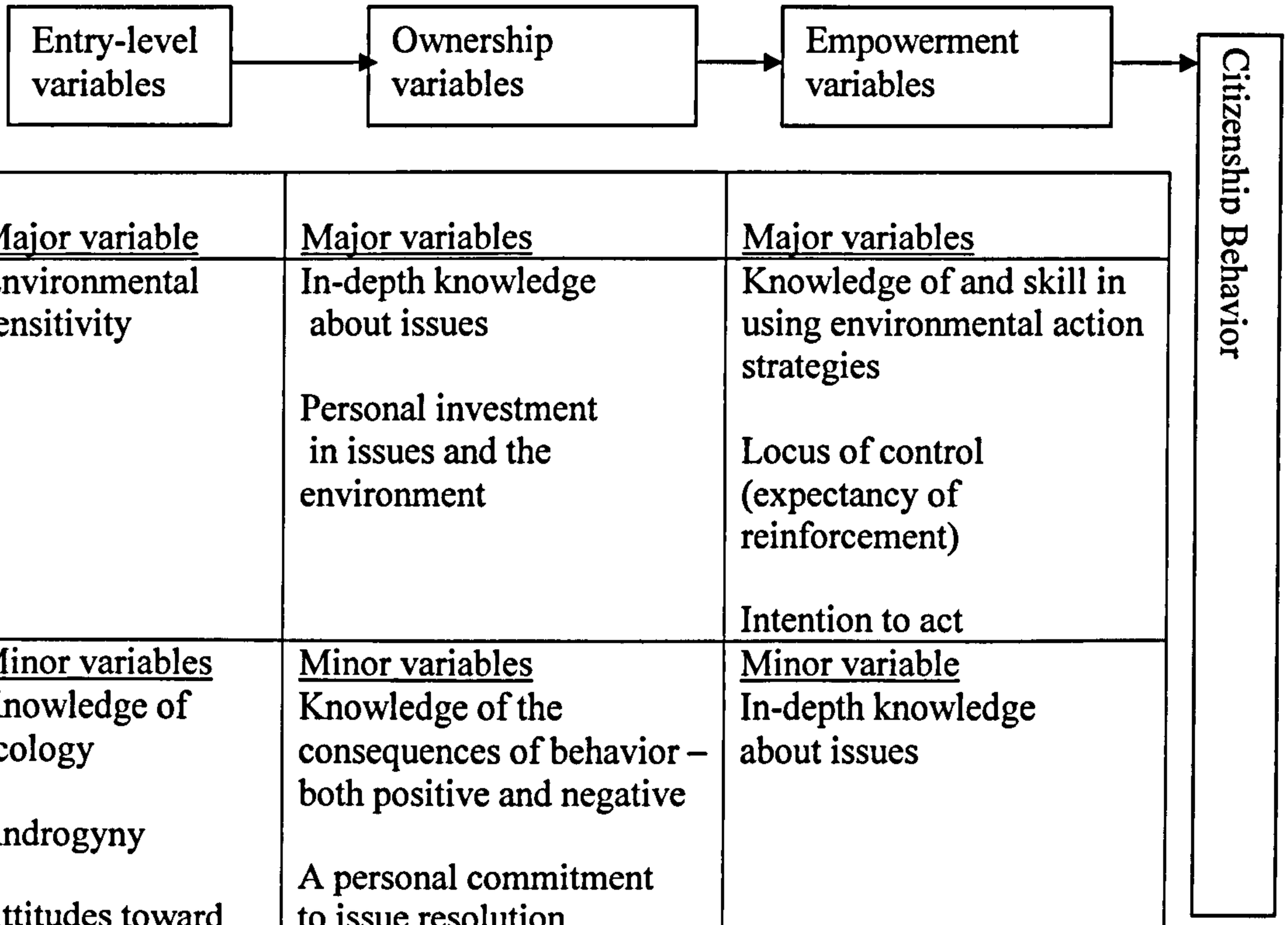


Figure 2.5 Behavior flow chart: Major and Minor variables involved in environmental citizenship behavior: (Hungerford and Volk model, 1990:11).

Beneath each variable are major and minor variables e.g. environmental sensitivity is a major variable of the entry-level variables.

However, having postulated these variables the researchers state that 'more research is needed to fully understand the relationships between these variables and

behaviour'. The complexity of the model makes it difficult to implement in the informal education setting as it is not clear what variable, or variables, are of primary importance in influencing environmental citizenship behaviour, and the model is not directly focused on behaviour change.

The authors highlight the lack of direction in environmental education and suggest a set of instructional goals for environmental education which incorporate the variables related to 'ownership' and 'empowerment'. This set of goals identifies a 'superordinate goal' as follows:

> 'to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and /or maintaining a dynamic equilibrium between quality of life and quality of the environment.' (Hungerford and Volk, 1990:13)

Four major goal levels were developed to help accomplish the superordinate goal;

Goal level I: The Ecological Foundations Level

Goal level II: The Conceptual awareness level - Issues and Values

Goal Level III: The Investigation and Evaluation Level

Goal Level IV: Action Skills Level - Training and Application

The authors then identified a number of critical components of a total education programme for environmental education if changes in learner behaviour are desired.

1. Teach environmentally significant concepts and the environmental interrelationships that exist within and between these concepts;

2. Provide carefully designed and in depth opportunities for learners to achieve some level of environmental sensitivity that will promote a desire to behave in appropriate ways;

3. Provide a curriculum that will result in an in-depth knowledge of issues;

4. Provide a curriculum that will teach learners the skills of issue analysis and investigation as well as provide the time needed for application of these skills;

5. Provide a curriculum that will teach learners the citizenship skills needed for issue remediation as well as the time needed for application of these skills;

6. Provide an instructional setting that increases learners' expectancy of reinforcement for acting in responsible ways, i.e. attempt to develop an internal focus of control in learners. (Hungerford and Volk, 1990:14)

Although Hungerford and Volk (1990) suggest that these could be facilitated by formal and non-formal education agencies they are in fact more relevant to formal curricula and are not appropriate for the needs of this research which explores behaviour change in free choice situations.

2.3.7 Conclusion on models of behaviour change in environmental education

The models of environmental behaviour reviewed here appear too complex to be used in guiding a method of influencing behaviour change. Part of the complexity is due to the number of variables which are proposed to influence behaviour. For instance, Hines et al (1986) propose six variables to account for responsible environmental behaviour. There are also problems in comparing studies because attitude has been defined in different ways and different measures of attitude are used. Where models describing environmental behaviour have been produced these are often too closely based on formal education requirements (Hungerford and Volk, 1990) making generalisations and application to an informal education study difficult, or the models are too complex to be applied to a different situation to influence behaviour.

2.4 Marketing and advertising

The second means of affecting behaviour examined is that of marketing and advertising. This is an enormous area and focus of contemporary culture which offers potential insights for this study. It is a reasonable assumption that, as with the focus of this study, advertisers are aiming to change behaviour in their case by encouraging consumers to buy their products. Vestergaard (1986) quotes Lund's description of the "adman's task" as to:

1. attract attention,
2. arouse interest,
3. stimulate desire,
4. create conviction,
5. get action.

The implication is that behaviour is influenced by advertisements.

However in investigating the theory of advertising further it is apparent that there is some debate about its role in persuading consumers. On the one hand, Driver and Foxall (1984, in Leiss et al 1986: 39) state that

> 'Most people are indifferent to most of the information about goods already circulating around them and are uninterested in obtaining more. For many purchases a decision process never occurs, not even on the first purchase... Advertising seems to have no power beyond engendering passing interest and, perhaps cursory comparative evaluation; it is certainly, of itself, incapable of building preference or conviction.'

On the other hand, there are a number of writers arguing the case for the persuasive powers of advertising. Sandage (1976, in Leiss et al 1986) argues that

> 'Modern society emphasizes the right of every person to be employed. To achieve this, high-level consumption is essential...This

will require persuasion. This is the function of advertising.'

A Royal Commission report in Canada on consumer problems stated bluntly

> 'The view that persuasion is bad... must be rejected out of hand. Persuasion is an inherant part of the democratic process.' (Leiss et al 1986)

Linder (1970, in Leiss et al 1986) takes this one step further by concluding that we want to be persuaded in the shortest possible time, so that we have some basis for our decisions and enough time left over after shopping to actually enjoy the many things we come to possess.

Leiss et al (1986) describes advertising thus:

> 'Modern advertising is important for the communicative power of the message forms it has devised, for the influence it exerts on other forms of cultural production, and for the ways in which it stratifies audiences in order to enhance its impact on the promotion of goods in everyday life.'

Accepting, for the moment, that advertising is aimed at persuading the consumer much of the focus of persuasion research has tended to be on verbal strategies rather than investigating the role of images. However, images are an integral and powerful part of the persuasion message in advertisements. Messaris (1997, in Gass & Seiter, 2003) is one individual who has analysed the role of images.

Messaris conceptualises the role of images in advertising suggesting images persuade in three ways; through iconicity; indexicality; and syntactic indeterminacy, (Messaris, 1997, in Gass & Seiter, 2003). Iconicity means that the images persuade by functioning as 'icons' i.e. that they resemble the things they represent. The use of a model to advertise perfume can act on the viewer's emotions and arouse a positive

emotional response. An anti-drink driving campaign can use images of car accidents to arouse negative responses in the viewer. An image can make something look real such as an advertisement for pain relief through showing someone with a severe headache with their head split into two. Interestingly images can violate the reality they represent (Messaris, 1997).

Images persuade through indexicality. This refers to the ability of images to refer to an event that has happened or show that something took place. This could be a footprint on the beach documenting that a person was there, or smoke coming out of a car exhaust pipe representing pollution. 'Indexical images often function as a form of sign reasoning' (Gass and Seiter, 2003: 311). A photo of children who are missing limbs serves as proof that land mines kill and maim innocent civilians. However, the documentary aspects of images can be misleading. Reporters can alter photographs to give a more stunning image which fits their story; events can be staged and recorded. The indexicality of events should be viewed critically.

Images can also persuade through syntactic indeterminacy according to Messaris (1997). This means that they cannot convey precise relationships between things, unlike words. Messaris (1997, in Gass and Seiter, 2003) notes 'what visual syntax lacks, especially in comparison to verbal language, is a set of explicit devices for indicating causality, analogy, or any other relationships other than those of space or time.' This means that pictures can be used to equate one thing with another by association. For instance an advertiser can equate a product with a social status by pairing the product with cool, sexy or classy images such as is done in car advertisements. Although Messaris conceptualises the different roles of images he does not really explain their impact on attitude and behaviour.

Work on investigating attitudes to advertisements by Brown and Stayman has tested alternative structural models of the process through which attitudes are influenced by prior variables and the influence on advertising outcomes. Brown and Stayman (1992) assessed four models first proposed by Lutz et al (1983) (Fig 2.6) through using a meta-analysis of 47 independent samples reported in 43 articles.

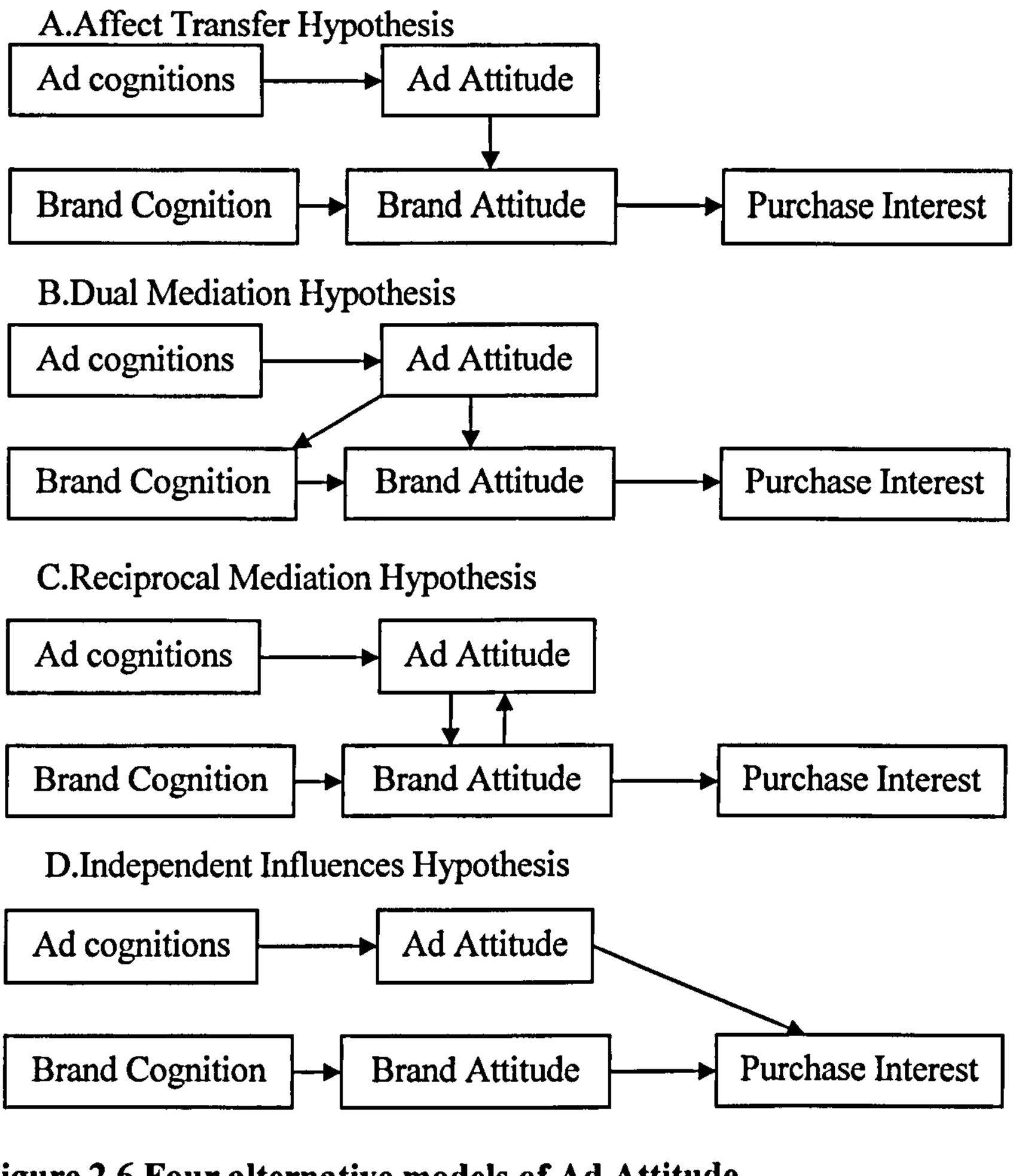


Figure 2.6 Four alternative models of Ad Attitude

Ad cognition= recognition and knowledge of a particular advertising campaign
Ad Attitude=global evaluation of a specific advertising campaign
Brand cognition= recognition and knowledge of a particular advertising brand
Brand attitude=global evaluation of a particular advertising brand
Purchase interest= measure of likelihood of purchasing the product

Previous individual research studies had indicated support for the dual mediation hypothesis model and the results of the meta-analysis confirmed support for this model with a superior fit for the data over the other three models. This model shows a direct effect of ad attitudes on brand attitudes as well as an indirect effect via brand cognitions. The effect of brand cognitions is particularly significant on brand attitudes.

'Our meta-analysis of findings related to ad attitudes suggests that the

relationship between ad attitude and other variables are strong but vary according to a number of methodological factors. In addition the influence of ad attitude appears to occur via paths specified in the dual mediation model with a relatively stronger indirect path via brand related cognitions than has been reported in previous empirical research.' (Brown & Stayman, 1992: 49)

The evidence suggests that the influence of advertising on receivers' attitudes toward a given brand or product may come about not only through receivers' beliefs about the products characteristics but also through the receivers evaluation of the advert itself. As receivers have more favourable evaluations of the advertising they come to have more favourable attitudes to the product being advertised. This could have implications for large environmental organisations like the National Trust which has a recognised brand. In an environmental context it could suggest that where visitors have a favourable response to the Trust brand they may be more likely to be persuaded to follow a certain requested action such as shutting a gate or taking home litter if the request is backed up by the Trust brand.

The current trend in marketing green consumer products has led to an interest in investigating conservation attitudes and their link to consumer behaviour because of the need to develop marketing strategies and or public policies to change consumer attitudes and behaviours towards environmentally polluting products. The majority of work in this field falls into the descriptive type. For example Alwitt and Berger (1993) used attitude strength to predict behaviour. They found consumers had a high level of concern for the environment but when it came to consuming products and services their actions were often inconsistent with these attitudes. Alwitt and Berger investigated single serve aseptically packed puddings, juices and fruits. These have a convenience for customers but contribute substantially to the solid waste stream. The study measured attitude valence (whether the attitude was positive or negative) and four dimensions of attitude strength with respect to the single serve product using a computer aided self-administration survey. General attitudes to the environment were also measured. Not surprisingly the researchers found a general attitude toward

the environment was not significantly related to purchase intent toward single serve packages but attitude toward the product category was positively related to purchase intention. This is entirely consistent with the Ajzen and Fishbein TRA that the target of the attitude and the behaviour must correspond and they acknowledge this in the discussion:

> 'Because consumers who use environmentally sensitive products such as single serve aseptic packages often have a lot of direct experience with them, they are likely to have positive overall attitudes which are more likely to predict their behavioural intentions toward the product.' (Alwitt and Berger, 1993: 193).

No attempt was made to influence behaviour but Alwitt and Berger go on to report that the attitudes may be difficult to change:

> 'These attitudes and behaviors may be particularly difficult to change using indirect persuasion techniques (such as advertising). Rather, behavioral interventions may be called for, such as taxes to raise prices or regulation of waste disposal.' (Alwitt and Berger, 1993: 193).

However, if the Ajzen and Fishbein model of behaviour change is followed it should be possible to have an effect through advertising by targeting the attitude toward the behaviour. An approach which involved persuasion in the first instance would be preferable to regulation. This descriptive study shows a lack of correspondence between attitude and behaviour, and as in earlier studies described within environmental education, e.g. Scott and Willits (1994), the target of the attitude and behaviour differ.

In a similar vein, in a study linking attitudes to a particular behaviour, Schwepker and Cornwell (1991) investigated ecologically concerned consumers and their intention to purchase ecologically packaged products. Attitude toward ecologically

conscious living, attitude toward litter, locus of control and the perception of pollution as a problem were found to be significant discriminating variables. Implications for marketers and public policy makers were provided. Unlike Alwitt and Berger (1993), Schwepker and Cornwell did suggest that consumers would be willing to make alterations in their consumption behaviour. They are willing to purchase products in larger packages with less frequency, products in less attractive packages and products in redesigned packages which contribute less solid waste. They believe:

> 'Rather than placing more stipulations in the form of laws for consumers and/or marketers, policy makers might benefit from informing the public of the solid waste problem and attempting to influence attitudes towards pollution.'(Schwepker and Cornwell, 1991: 96).

No generalizable model emerges from this study because the results are specific to the study. However, some of the results do fit with the Ajzen and Fishbein model of behaviour change because some of the measures include the attitudes towards the action e.g. concern about litter and belief that there is a pollution problem. The different conclusions by the two sets of researchers as to the usefulness of persuasion by advertising could be due to the failure of the Alwitt and Berger study to identify the link between positive environmental behaviour and changing the behaviour towards purchase of single serve products. They needed to investigate the attitude toward the behaviour rather than general environmental attitudes. That is, they needed to investigate attitudes towards purchase of an environmentally friendly product and reduction of waste from packaging.

2.4.1 Conclusion

The investigation of research in marketing and advertising has not shown any alternative models to the Ajzen and Fishbein Theory of Reasoned Action (TRA) model which could be used to guide this study into behaviour change. Although

advertising is in essence a persuasion process, where advertising is produced to persuade the consumer to change their attitude and behaviour towards a certain product, the literature does not seem to show research of models to guide this process. Once again many of the studies are descriptive studies and provide plenty of factors which affect behaviour in different situations but no repeatable model. Investigations in marketing and advertising would benefit from a closer study of the social psychology literature. For instance Ajzen and Fishbein are referenced in the Alwitt and Berger (1993) paper but the TRA is not applied to the study. However, the TRA is used extensively in the consumer behaviour literature to *predict intentions* for consumer products including toothpaste, dog food, beer, detergent, 7-up, and diet capsules (Lee and Green, 1991).

Again the inability in research studies to find any link between attitudes and behaviour is in part due to the lack of definition of attitude in many of the investigations. Because the attitude is not clearly defined there is often a lack of distinction between general and specific attitudes, also the methods used to measure attitude differ between studies e.g. Alwitt and Berger (1993) used a questionnaire measuring seven sets of constructs of attitude toward single serve packages and then correlated these against general attitudes to the environment. The Theory of Reasoned Action shows that a link between the two would not be found because they are focused on different targets. The consequence is that no clear model emerges as a means to influence environmental behaviour through attitudes from this literature.

2.5 Models of behaviour change in social psychology

The areas of attitude and behaviour have long been the focus of studies in the social psychology field. Environmental educators have failed to look to this wider literature to determine factors which will link environmental attitudes and behaviour.

Through examining the literature the following models and theories of attitude and behaviour change have been investigated; first, Festinger's theories of 'cognitive dissonance' (Festinger, 1962), which works from behaviour back to attitude;

secondly, Bem's alternative view of the cognitive dissonance phenomena as self perception (Bem, 1967); thirdly, modifications of the Ajzen and Fishbein Theory of Reasoned Action by Bentler and Speckart (1979); and finally Triandis attitude behaviour model (in Boyd and Wandersman, 1991). The relevance of the Theory of Reasoned Action to the experimental design in this thesis will be shown.

The work of Festinger has received widespread attention from personality and social psychologists and as such is reviewed here to elucidate what the theory can bring to bear on the processes of behaviour change. Festinger's theories of 'cognitive dissonance' work from behaviour back to attitudes, i.e. 'The changing of one's opinions and evaluations in order to bring them in line with one's actual behaviour', (Festinger, 1962). The most frequently cited evidence for dissonance theory comes from an experimental procedure known as the forced-compliance paradigm. In these experiments, an individual is induced to engage in some behaviour that would imply his endorsement of a particular set of beliefs or attitudes. Following his behaviour, his "actual" attitude or belief is assessed to see if it is a function of the behaviour in which he has engaged and of the manipulated stimulus conditions under which it was evoked. However, this theory, while novel, is concerned with influencing attitudes rather than behaviour. It implies that following a forced behaviour change, attitudes are brought into line with the forced behaviour because the person does not want to experience dissonance (when the attitude and the behaviour are inconsistent with each other). This could imply that it might be easier to influence a particular behaviour on a second occasion if the behaviour has been forced the first time and the dissonant attitude has been brought into line with the forced behaviour.

Bem (1967) contrasts this with 'radical behaviourism' arguing that the deductive nature of the dissonant theory is largely illusory because in practice inferences are made which are necessary to explain the theory such as, the inference that within the person a dissonance or conflict occurs between the actions and the attitude toward them. Bem argues that there is an alternative explanation to the findings of Festinger stating that:

'the theory of cognitive dissonance attempts to account for observed functional relations between current stimuli and responses, by postulating some hypothetical process within the organism - an inferred process of the arousal and reduction of dissonance.'

'In contrast the alternative formulation to be presented here eschews any reference to hypothetical internal processes and seeks, rather, to account for observed functional relations between current stimuli and responses in terms of the individual's past training history. Such an approach has been called "radical behaviourism."'(Bem, 1967: 184)

Bem is suggesting that the experimental subject is not seeking to reduce dissonance internally but reacting to past training history, as he suggests there is no dissonance taking place it is an inference of the researcher. This is very much a behaviourist approach. The behaviourist's goal is to account for observed relations between current stimuli and responses in terms of the subject's past training history and a small number of basic functional relations discovered in the experimental analysis of simpler behaviours.

The most widely quoted study based on the cognitive dissonance approach, is one conducted by Festinger (1962) with the help of Carlsmith. Sixty undergraduates were randomly assigned to one of three experimental conditions. The $1 group were required to perform long repetitive laboratory tasks, then were hired by the experimenter as an 'assistant' and paid $1 to tell a waiting fellow student (stooge) that the tasks were enjoyable and interesting. The $20 group were hired for $20 to do the same thing. The control subjects simply engaged in the repetitive tasks. After the experiment each subject indicated how much he had enjoyed the tasks. The subjects paid $1 evaluated the tasks as significantly more enjoyable than those who had been paid $20. The $20 group did not express attitudes significantly different than those expressed by the control groups. Dissonance theory interprets this in the following way, all the subjects initially held the cognition that the tasks are dull and boring. The experimental subjects hold the cognition that they have expressed favourable

attitudes toward the tasks to a fellow student. Subjects in the $1 group find these two cognitions are dissonant because their overt behaviour does not 'follow from' their cognition about the task nor does it follow from the small compensation they are receiving. To reduce the dissonance they change their cognition about the task and make it consistent with their behaviour, they become more favourable toward the task. The subjects in the $20 group experience no dissonance because their engaging in the behaviour 'follows from' the large payment they receive.

Bem considers the results show a case of self-perception. An outside observer would judge the $20 communicator to be affected by the money he received rather than conveying a true reflection of what he feels. The $20 communicator is not credible in that his statements cannot be used as a guide to infer his actual attitudes. The observer could conclude that the individual actually found the tasks dull and repetitive. An outside observer would be more likely to judge the $1 communicator as expressing his true opinions and that he is favourable towards the tasks. Bem then suggests that when the outside observer and communicator are placed in the same skin, 'the findings obtained by Festinger and Carlsmith are the result. There is no dissonance as the dependent variable (the subject's self description statement of attitude or belief) is viewed simply as a self-judgement based on the available evidence, evidence that includes the apparent controlling variables of the observed behavior.' The $20 communicator is affected by the money and the $1 communicator is not suffering from dissonance but is expressing his true opinion which is his self perception of the task. Bem asserts that people don't rationalize their behaviour to reduce an unpleasant tension, but rather they reason what their attitude *must* be for them to have acted as they did. So the $1 participant has reasoned that his attitude must be favourable to have carried out the task

These studies imply that if a behaviour change is forced the attitude towards the behaviour will change to come in line with it. They do not assist in proposing a model for behaviour change but show subsequent actions if a behaviour change is forced. They show the close link between attitude toward the behaviour and behaviour. Although dissonance theory has yielded a number of findings bearing on

the processes of persuasion it is of limited use to this research on behaviour change, as behaviour change is difficult to force in the context in which this research is set. The use of forced behaviour change will be discussed in the conclusion.

A key element in an attempt to change behaviour is the use of a persuasive communication. Ajzen and Fishbein demonstrate the use of persuasive communications in a number of studies. The majority of persuasive communications provide individuals with information which, it is hoped, will induce them to behave in the desired manner. Museums have used persuasive communications in exhibitions for many years. An early example was an exhibition in Leicester Museum which aimed to decrease infant mortality with the information given in the display (Lowe, 1916). To be effective a persuasive communication should contain information linking the behaviour to various positive or negative outcomes. When the aim of the message is to change behaviour, the message will often include one or more recommended actions.

2.5.1 An example of a persuasive communication using the Ajzen and Fishbein Theory of Reasoned Action

The following study carried out by Ajzen and Fishbein (1980: 229) on influencing the behaviour of alcoholics shows how the use of a persuasive communication can influence beliefs.

In a hospital, only 50% of the patients diagnosed as alcoholic were willing to be transferred to the hospitals Alcoholic Treatment Unit (ATU). A decision was made to use a persuasive communication in order to encourage more alcoholics to sign up for the unit. To increase the likelihood that a person would sign up for the ATU the hospital had to change the primary beliefs that were functionally related to that behaviour. Ideally they would conduct a pilot study in which salient beliefs were elicited, then construct and administer a standard questionnaire based on these beliefs. Responses in the pilot study provided information about the relative weights of the attitudinal and normative (i.e. what specific groups such as close friends and

relatives think about the behaviour) components and permitted identification of the salient beliefs which best discriminate between respondents who intended and those who do not intend to perform the behaviour in question. On the basis of this information which of the two components (attitudinal or normative) to attack was decided and then a message or messages constructed containing information designed to change the primary beliefs underlying the component or components selected.

Signing up for ATU was found to be under more attitudinal than normative control (i.e. less affected by what people close to the subject wish) and so the attitudinal component was attacked in the attempt to change behaviour. Three different persuasive communications were constructed.

The first, the traditional appeal, was based on the health belief model. This appeal provided information about continued drinking, and although it stated that one can gain control over drinking by joining the ATU, it never directly attacked the receiver's beliefs about signing up for the ATU. Ten major arguments were used each linking continued drinking to a different negative consequence. The message then argued that the ATU had a programme that could help patients gain control over their drinking, and finally it recommended that they "sign up for ATU now". The second message, the negative appeal, was comprised of ten major arguments linking not signing up for the ATU with negative consequences. (These were the same 10 negative consequences as in the traditional appeal). The negative message also ended with the recommendation "sign up for the ATU now". The third message, the positive appeal, was the mirror image of the negative message. It had 10 major arguments linking signing up for the ATU with a positive consequence. It also ended with the specific recommendation to "sign up for ATU now".

These different appeals were tested using first a pre-test questionnaire which measured among other aspects the participant's intention to sign up for ATU, followed by a preliminary sign up sheet for ATU where participants were asked to circle "do" or "do not" depending whether or not they wanted to be transferred to

ATU. One to four days after the pre-test patients were assigned to one of four conditions, three experimental conditions where patients were exposed to one of three of the persuasive communications and a no-message control.

Of those patients who indicated that they were not willing to transfer to ATU, none in the no-message control group changed their mind. The traditional appeal did not increase the signing up rate appreciably (5% signed) but both the positive appeal (20%) and negative appeal (30%) significantly increased signing behaviour. Those participants who were initially willing to sign up for ATU, one in the no message control group (5%), one receiving the positive appeal (5%) and none in the group receiving the negative appeal changed their minds. In marked contrast 50% of the initially willing patients who received the traditional appeal did not sign up for the ATU. So the conclusion was that tackling the signing up behaviour in a persuasive communication was more effective than tackling the drinking behaviour. Both the positive and negative appeal improved signing up behaviour with the negative message being the most successful.

The methodology for this intervention was based on the Ajzen and Fishbein Theory Reasoned Action (1980) which states that the key influence on a person's behaviour is their intention to perform that behaviour. The intention is determined by the attitude toward the behaviour and the subjective norm, i.e. the person's perception of the social pressures to perform or not perform the behaviour. Influencing the attitude and subjective norm are; the beliefs underlying the attitude (i.e. that the behaviour leads to certain outcomes and the person's evaluations of these outcomes); and the beliefs underlying the subjective norm (i.e. that specific individuals or groups think that the person should or should not perform the behaviour) (see section 2.2). This theory of reasoned action contains many of the aspects which were lacking in the studies previously reviewed. It provides a clear path of influence and logical areas to tackle when influencing a behaviour change. For instance in the previous study on transferring to the ATU the attitudinal beliefs underlying drinking were influenced by a persuasive communication. The theory assumes that people are rational decision makers and use the information available to them. The theory is not too

complicated unlike the theories of Hines et al (1986) and Hungerford and Volk (1990) and does not contain multiple variables. It has been widely used and tested in a variety of situations e.g. in career choice (Strader and Katz, 1990), cultural differences in attitudes towards smoking (Marin, Marin et al, 1990), and teenage sexual behaviour (Gillmore et al, 2002). The theory of reasoned action provides a comprehensive framework that can help explain many of the inconsistent findings in the studies described in this chapter. The theory has a wide application being useful for most individuals and most social behaviours and it can be applied at different levels of generality.

> 'This theoretical framework integrates much of the currently accepted attitude-behavior knowledge into a theory which is explicit, testable, and widely generalizable.' (Fredricks and Dossett, 1983: 501)

In constructing a persuasive communication and identifying targets for persuasion the theory of reasoned action allows for two possibilities. The theory can indicate whether the focus is on the attitude or the subjective norm and the relative weights of these. Alternatively if the persuasive focus is to change the attitudinal or normative component then the theory of reasoned action can give guidance in distinguishing between those people who already intend to perform the behaviour and those who do not intend to perform the behaviour in question.

2.5.2 Modifications to the Ajzen and Fishbein model

The Ajzen and Fishbein model has been adapted and modified by Bentler and Speckart (1979) who believe that there is a direct link from attitude to behaviour and that previous behaviour has an impact on current intentions and future behaviour, (Fig 2.7).

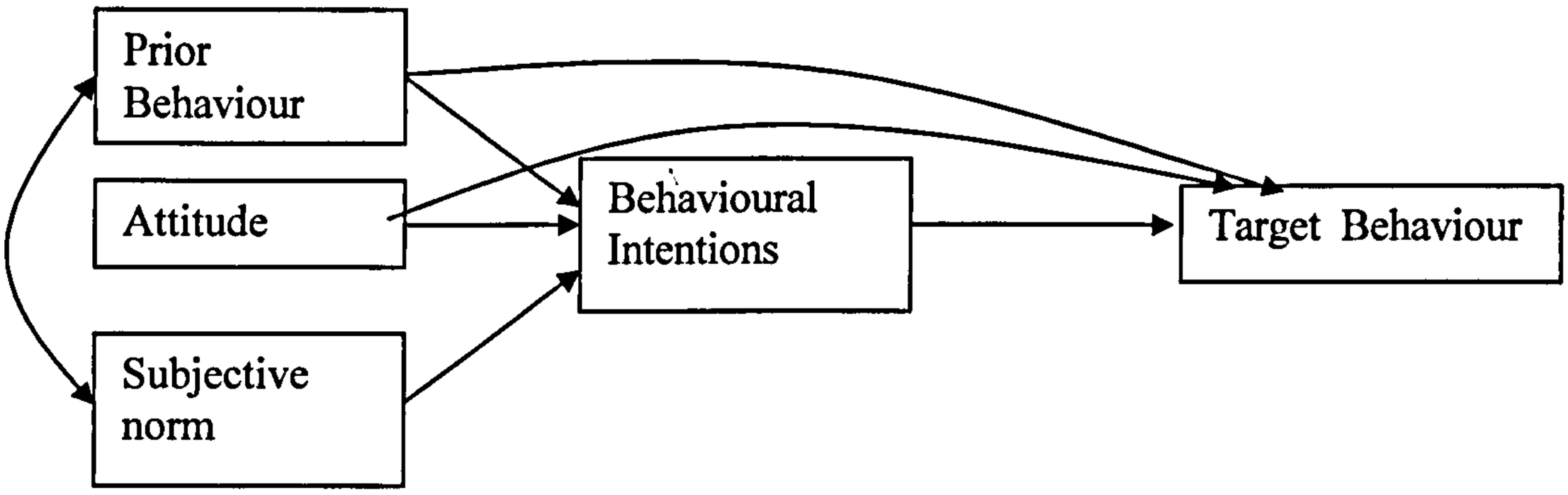


Figure 2.7 Modification of the Theory of Reasoned Action by Bentler and Speckart

Bentler and Speckart (1979) undertook a panel study of 228 college students based on questionnaire data that assessed attitudes, subjective norms, intentions and behaviour towards alcohol, marijuana and hard drug use. They used causal modelling on correlational data obtained from the college students to compare three theoretical models; the original Ajzen Fishbein model; a model linking attitude directly to behaviour without being mediated by intention; and the model shown in Fig 2.7 above. Bentler and Speckart felt that intentions may be directly influenced by factors other than attitudes and subjective norms i.e. previous behaviour. They found that the effects of attitudes and previous behaviour on subsequent behaviour were to a significant extent not mediated by intentions i.e. there was a direct link from attitude and previous behaviour to target behaviour as shown in Fig 2.7. That is a portion of behavioural variability was predictable from attitudes and previous behaviour without the effect of intentions. They suggested that their model represents a more accurate and generalized model of attitude-behaviour relations because it has greater applicability to varied content domains of attitude and behaviour. However, in attempting to influence and change behaviour, previous behaviour may well be relevant and a factor to consider, but it can not be an influence to change behaviour as it has already taken place and is therefore beyond control.

In contrast, Fredricks and Dossett (1983) make a telling point that, in the study of

Bentler and Speckart (1979), attitude was measured as the evaluative component only and did not include beliefs and belief strength. The students were asked for instance, "What do you think about...." "Drinking beer, wine or liquor with friends in the next two weeks" with responses on a continuum from "great idea" to "terrible idea". There were no questions on the beliefs underlying the attitude that the behaviour would lead to certain outcomes and the evaluation of those outcomes. Subjective norms were measured as belief strengths but did not include the motivation to comply and behaviour was measured by retrospective self report which is open to response bias, particularly in this case, when the target behaviours were use of alcohol, marijuana and hard drugs. Thus, although the measurement procedures were similar to the Ajzen and Fishbein model (1980), they did not correspond directly to their recommendations and may, therefore, have biased the results against the Ajzen and Fishbein model by an incomplete assessment of the components. Fredricks and Dossett have tested both the Ajzen and Fishbein model and the Bentler and Speckart model and found their study lent support to the Bentler and Speckart hypothesis of direct paths from prior behaviour to both intention and target behaviour, but not a direct path from attitude to target behaviour. The modified model of Fredricks and Dossett (1983), may be useful in the prediction of behaviour, but where behavioural change is sought, prior behaviour as a predictor of subsequent behaviour may not be so relevant in the intervention and it is not a factor which can be influenced, as it will have already taken place, whereas beliefs and attitudes towards the behaviour can be influenced. Since this study seeks to change behaviour, this suggests that Ajzen and Fishbein's model has more utility. Furthermore, Ajzen and Fishbein's model recommends that the beliefs underlying the attitude towards the behaviour and the subjective norm are targeted in any attempt to influence behaviour. By understanding the beliefs underlying prior behaviour this may help in explaining prior behaviour but will not move forward the sought behaviour change.

A final possible model which could be used to effect behaviour change is the Triandis attitude-behaviour model (Fig 2.8) (1977 in Boyd & Wandersman, 1991). It has many similarities with the model of Ajzen and Fishbein (1980). But it is a more

complex model which has been used less frequently in attitude behaviour research than the Theory of Reasoned Action (TRA). It has compared favourably with the TRA in prediction of behaviour e.g. In a study predicting church attendance with the TRA and Triandis models the TRA and Triandis models each predicted approximately 70% of variance in intention and behaviour (Brinberg, 1979 in Boyd & Wandersman,1991).

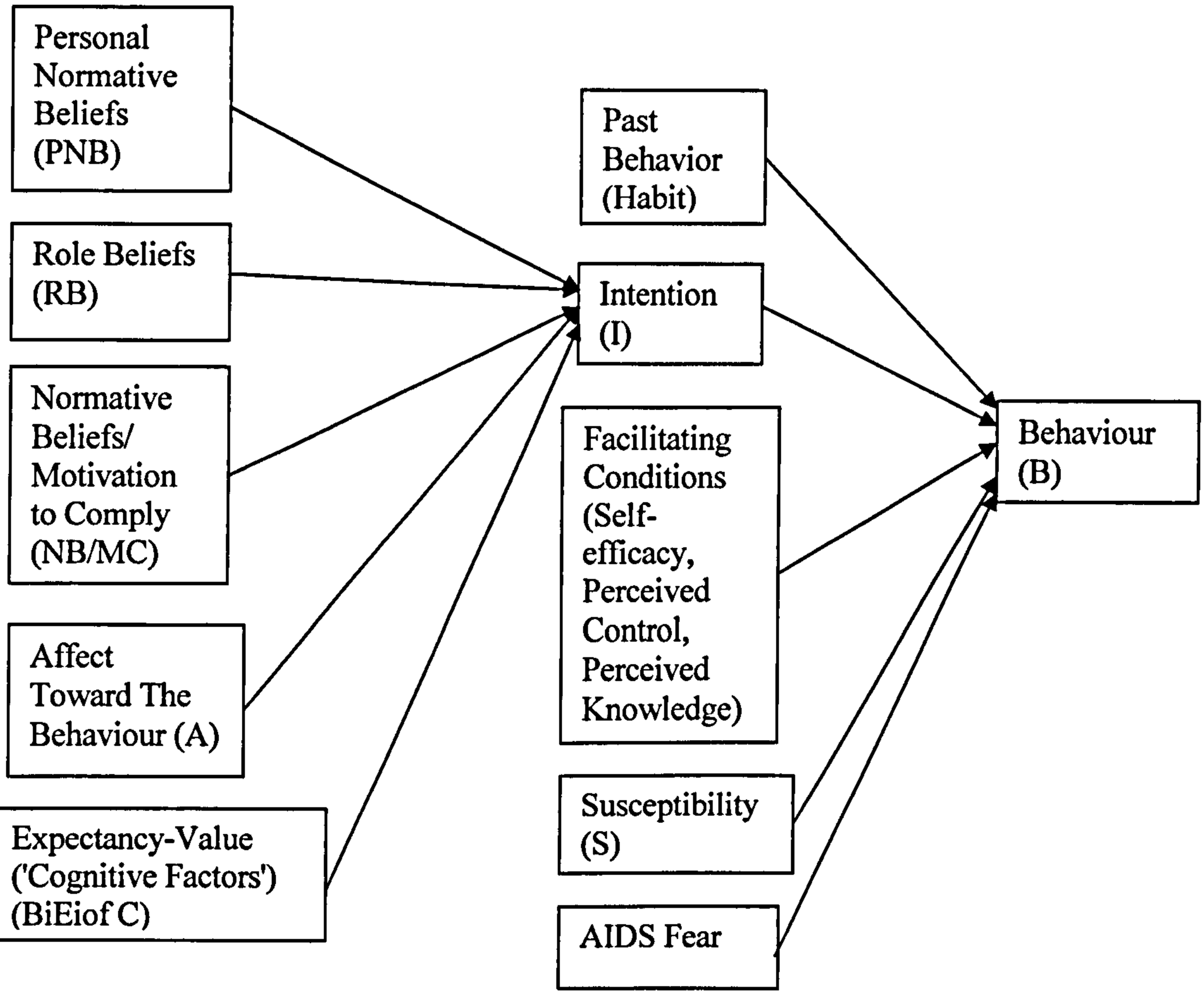


Figure 2.8 Triandis Attitude-Behavior Model used in a study of undergraduate condom use.

In comparing the two models, Boyd and Wandersman were assessing the usefulness of each theory's specific constructs for developing behaviour change interventions to increase condom use amongst college undergraduates. If the Triandis model

components had provided significantly better explanation of condom use intention/behaviour than the TRA, then these components were useful intervention targets. If the TRA was as successful as the Triandis model then a primary focus on outcome beliefs and social influences alone may have been sufficient in interventions to increase condom usage.

Boyd and Wandersman compare the Theory of Reasoned Action and Triandis model as follows:

> 'Both models rely on expectancy-value (or beliefs of outcomes of the behaviour) and subjective norm constructs to explain intention to perform a specific act. However, several differences are apparent between the TRA and Triandis model. The Triandis model includes a purely affective measure of attitude, in addition to the more 'cognitive' expectancy value construct, to explain intention. Also the Triandis model includes other normative influences (personal normative beliefs, role beliefs), beyond the normative belief/motivation to comply construct, to explain intention. Finally, Triandis views the likelihood of a specific act as being less under a subject's volitional control than does TRA. While the TRA relies on intention alone to predict behavior, Triandis includes motivation/ susceptibility, facilitating conditions, and past behavior or habit, as well as intention to predict a specific behavior.' (Boyd and Wandersman, 1991: 1814-1815).

The Triandis model produces a much more complex model than TRA which has been used less frequently possibly because of its complexity.

To compare the usefulness of the Triandis model against the TRA, Boyd and Wandersman gave 190 college students a questionnaire designed to measure the components of the two models. The results showed the importance of the expectancy value, or beliefs regarding the outcomes of the behaviour, and normative belief/

motivation to comply (with specific referents) variables to explain intention. Personal normative beliefs in the Triandis model significantly added to the explanation of intention. Based on these results of Boyd and Wandersman an alternative prediction model of condom use was presented. This alternative model removes role beliefs, affect towards the behaviour, and facilitating conditions to simplify the model (Fig 2.9).

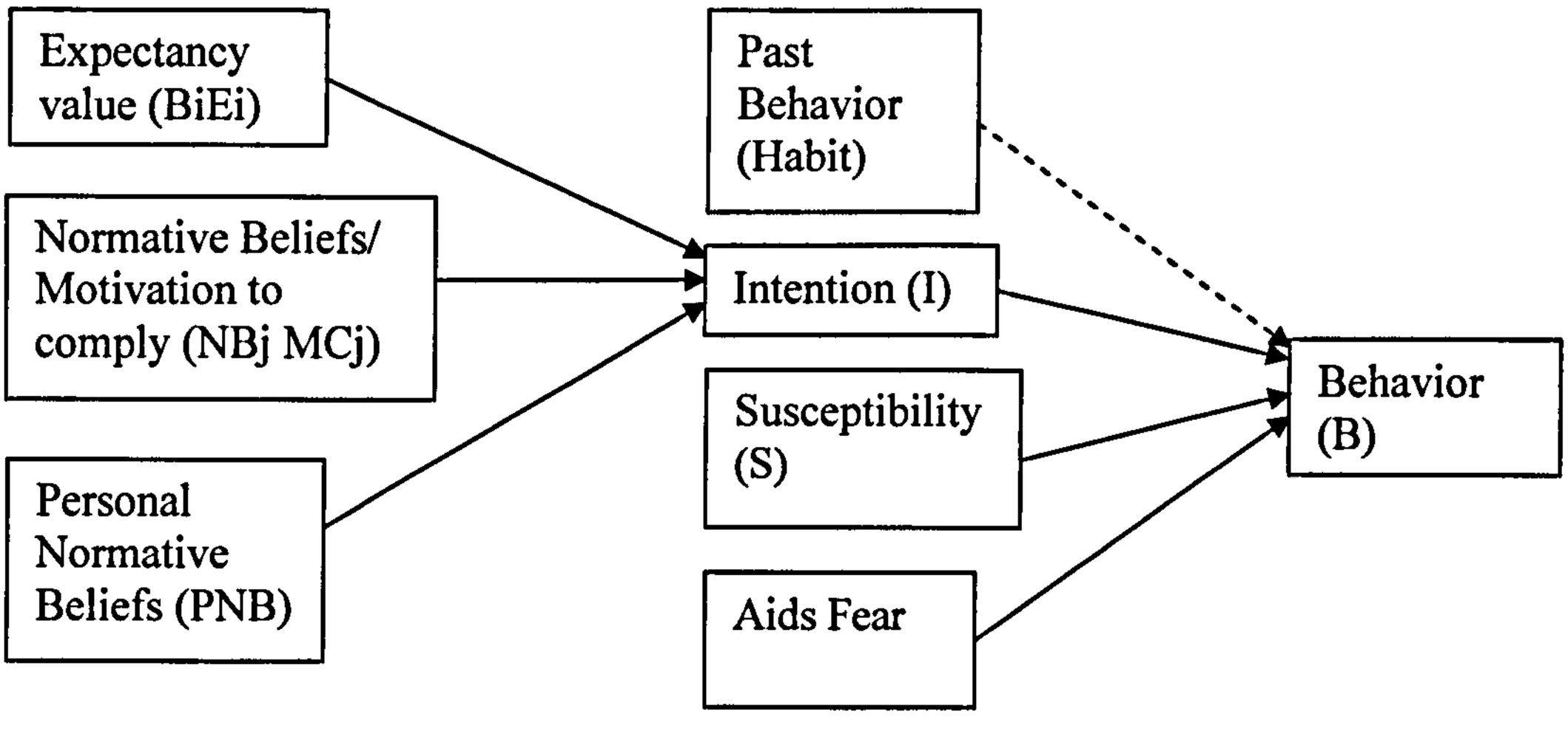


Figure 2.9 Revised Condom Use Prediction Model, (Boyd and Wandersman,1991: 1823)

This new model lies very close to the Ajzen and Fishbein Theory of Reasoned Action. If susceptibility and Aids fear are removed as being specific to this study of condom use, and past behaviour is acknowledged as being a variable which can not be influenced, then the two models correspond except that the mediating effect of attitude on intention has been removed. The expectancy value and normative beliefs/motivation to comply directly predict intention. Thus the basic constructs of beliefs, intention and behaviour of the Ajzen and Fishbein model are present in the Boyd and Wandersman model. The only other difference is the personal normative beliefs in the Triandis model which could be seen as forming a part of beliefs towards the subjective norm in the Theory of Reasoned Action.

For the purposes of this study, the Triandis model does not provide, however, as

useful a model as the Theory of Reasoned Action. In the context of this study it is more plausible that behaviour is under volitional control and less likely that susceptibility, facilitating conditions, past behaviour and habit are important in changing the behaviour of a person. These are important in this specific study of condom use but in constructing a general model of behaviour, which can be used in other situations, they are less relevant. These are considered external variables in the Ajzen and Fishbein model.

2.5.3 The theory of planned behavior

Ajzen (1988) developed the Theory of Planned Behavior to extend the Theory of Reasoned Action beyond easily performed voluntary behaviours. The Theory of Planned Behavior adds a third element - perceived behavioural control - to the two other elements influencing behavioural intention. Perceived behavioural control (PBC) is the person's perception of the ease or difficulty of performing the behaviour. It is taken to be a function of a person's beliefs about the resources and obstacles relevant to performance of the behaviour. It seems plausible in that an obstacle to performing a behaviour could be due to the perceived lack of ability to perform the behaviour rather than negative attitudes or subjective norm. The Theory of Planned Behaviour (TPB) has received wide use and support from researchers. O'Keefe (2002: 115) states:

> 'The empirical evidence indicates that as the TPB suggests, adding PBC to the original TRA does often improve the predictability of intention. Such effects have been obtained across a wide variety of behaviours, including exercising (e.g. Gatch & Kendzierski, 1990),... voting (Netemeyer & Burton, 1990),... and blood donation (Giles & Cairns, 1995). Although the TPB does not always outperform the TRA... the number and diversity of supportive findings suggest that the TPB will often provide a superior model'.

Four broad alternative means for influencing the PBC are described by O'Keefe

(2002: 117). For instance, the PBC may be influenced by removing an obstacle to behavioural performance. The obstacle might just be a lack of information in which case the persuader needs to provide the necessary information e.g. a first-time buyer may not know the process for buying a house. Providing the information on buying a house may remove that obstacle to performing the behaviour. Secondly a persuader may create the opportunity to successfully perform the behaviour in question, (the reasoning behind this being 'I've done it before so I can do it again'). Thirdly a persuader can provide examples of others performing the behaviour successfully (the reasoning behind this being 'if they can do it I can do it'). Finally, O'Keefe suggests that simple encouragement can make a difference. A person hearing a persuader saying 'you can do it' may enhance that person's perceived ability to complete a task.

2.5.4 Conclusion

The review of the many models that influence volitional behaviour here would suggest that the Ajzen and Fishbein Theory of Reasoned Action model is the best model to guide the intervention in this study. It has been shown to be a model relevant to behaviour change in many different situations e.g. Strader and Katz (1990), Marin, Marin et al (1990) and Koballa (1988). It is widely used by many researchers in subjects varying from teenage sexual behaviour (Gillmore et al, 2002) to consumption of meat in the BSE crisis (Harvey et al, 2001). It is a model which guides a behaviour change intervention by giving logical areas to tackle to influence the behaviour e.g. beliefs underlying the attitude toward the behaviour. It is a rational model of the persuasion process. It assumes that people are rational decision makers who make use of the information available to them. It explains the roles of attitudes and intentions in behaviour. It is straightforward as it relies on influencing the beliefs underlying the attitude towards the behaviour rather than multiple variables in order to influence the behaviour. Intention is a function of attitudes and subjective norms; attitudes and subjective norms are functions of underlying behavioural and normative beliefs, respectively. Information about these underlying behavioural and normative beliefs can be used to develop communications designed

to reinforce or change intentions. Messages should be designed to attack specific beliefs underlying the targeted intentions. The model fits the criteria described for this study i.e. it enables the design of interactions to influence human behaviour and provides an effective strategy for behaviour change. It is applicable to an informal leisure setting and is of use in influencing attitudes and behaviour towards the environment and conservation.

Chapter 3 The methodology of behaviour change and the role of persuasive communications

3.1 Introduction

This thesis seeks to implement an effective, repeatable, model to influence and change behaviour towards the environment in three different settings. To guide the intervention in this study i.e. to alter existing behaviour, the model described earlier (chapter 2 section 2.2), devised by the social psychologists Ajzen and Fishbein (1980) called The Theory of Reasoned Action, is used. According to this model, a change in beliefs underlying the attitude towards the behaviour, or a change in beliefs underlying the subjective norm (what other people think about my performing the behaviour), can lead to a change in attitude and, hence, have a positive influence on the intention to perform the behaviour. One frequently used strategy to change beliefs is by the use of a persuasive communication. The form and essential characteristics of a persuasive communication are reviewed here, followed by a review of research into what makes a persuasive communication effective. The use of a persuasive communication in the exhibit at Chelsea Physic Garden is then described in chapter 4.

Persuasive communications have been shown to be an effective way of changing behaviour in studies which vary from changing the behaviour of alcoholics (Ajzen and Fishbein, 1980 ch15) to career choice (Strader and Katz, 1990). There is also a long history of exhibitions being designed in an attempt to produce changes in behaviour, (for an early example see Lowe (1916)).

3.2 Defining persuasion

Persuasion according to Gass and Seiter (2003) is a positive and powerful social force. It is used in many situations to achieve many different outcomes. For instance, persuasion helps forge peace agreements between nations and helps open up closed societies. Persuasion is what a negotiator uses to convince an armed, barricaded

suspect not to kill any hostages. Persuasion is critical to the fund raising efforts of charities and philanthropic organisations in getting contributors to part with their money. Persuasion convinces motorists to buckle up when driving or to refrain from driving when they have had too much to drink. Persuasion helps to sway 'at risk' students to remain in school and complete their education. Persuasion is frequently used in the healthy living campaigns to convince an alcoholic or drug dependent family member to seek professional help. Persuasion offers a means for warning pregnant women about the dangers of drinking or taking drugs during pregnancy. Persuasion helps convince older adults to seek preventative medical care, such as annual breast examinations, or prostate examinations. Persuasion is one of the devices used by managers to promote tolerance and respect among employees in the workplace. Persuasion is how the coach of a poorly performing team inspires the players to 'give it their all'. Persuasion is a tool used by parents to urge children not to accept rides from strangers or to allow anyone to touch them. In fact very little of what we see in the world could be accomplished without persuasion. Gass and Seiter define persuasion in the following way:

> 'persuasion involves one or more persons who are involved in the activity of creating, reinforcing, modifying or extinguishing beliefs, attitudes, intentions, motivations, and/or behaviors within the constraints of a given communication context.'(Gass and Seiter, 2003: 34).

This defines persuasion as an active process – it is something people do. Gass and Seiter believe that the topic of persuasion is wide ranging, with pure cases of persuasion and borderline cases and they believe that most, if not all, communication transactions contain the ingredients for persuasion. It is the degree to which the ingredients are present, not their mere presence or absence that is what matters.

O'Keefe (2002: 5) defines persuasion as 'a successful intentional effort at influencing another's mental state through communication in a circumstance in which the persuadee has some measure of freedom.' This is a definition which relies on the persuasion being successful. Of the two definitions quoted, the first one more

closely suits the purposes of this research as it does not rely on the effectiveness of the persuasion.

3.3 The Role of a Persuasive Communication in Behaviour Change

3.3.1 Definition of a persuasive communication

Having established a definition of persuasion, it is an important part of this research to study its use in a persuasive communication; one of the most frequently used strategies to attempt to persuade. This type of communication can take a number of forms and be used for different reasons. The essence of a persuasive communication is described by Ajzen and Fishbein (1980: 218) when they state that the majority of persuasive attempts provide individuals with information which, it is hoped, will induce them to behave in the desired manner. This description by Ajzen and Fishbein implies that there are two necessary attributes which make up a persuasive communication; the information, and an inducement or persuasion.

A typical example of a persuasive communication would be the leaflet produced by the Department of the Environment (1990) '*Wake up to what you can do for the environment.*' (See appendix 3).

> 'This leaflet offers some simple advice about practical steps YOU could take to protect or improve the environment. You may think one person acting alone can't do much, but if we all do something there will be a big impact. And if we don't some of the problems will get worse.' (D.O.E. 1990: 1)

The leaflet offers readers practical steps that they can take to improve their environment, with the inducement that, if they do as suggested, they can make an impact. The leaflet also threatens that 'if we don't some of the problems will get worse'.

A similar example is found in a leaflet produced by Safeway, 'Thinking for the

future'. This states: -

> 'We can all take action for a better environment. On their own, our actions may seem small. But Safeway has 260 million customers a year and if we all take action we can make a difference.'

Here again the inducement that we can all make a difference if we take action is offered with the information.

An example of a persuasive communication where information is given, and the inducement is in the form of a threat, is found in the negative Alcoholic Treatment Unit (ATU) appeal.

> 'So, in closing, I would like to stress that by not signing up for the ATU, you are not only refusing to face reality but you are losing the opportunity to learn to control your drinking. Thus not signing...' (Ajzen & Fishbein, 1980: 231).

Fear can act as an inducement, but different degrees of fear have been found to have different effects on people depending on their initial levels of anxiety. In an experiment attempting to produce attitude and behaviour change to dental hygiene by manipulation of fear, Janis and Feshbach (1953) found that the stronger the appeal to fear the more anxious the subjects were, but as far as changes in dental behaviour were concerned, the high fear condition proved to be the least effective.

A museum exhibit just presenting fact, such as the information given in The Natural History Museum's Ecology exhibition on the series of globes introducing Earth's air, water and rocky crust which, 'with energy from the sun, makes the vital components for life', would not be termed a persuasive communication. The exhibit is a presentation of information but without any form of inducement to encourage action. The designers of this exhibit do not expect any particular change in behaviour as a result of gaining the information.

Another example of a communication which is not persuasive is a prohibitive sign such as 'keep off the stones' or 'do not use metal detectors here'. Information has been given in the sign but there is no attempt to persuade or induce the reader to conform. There is no information on what will happen if you do not comply with the notice i.e. there is no threat.

Advertising often uses a very subtle form of persuasive communication. The aim of advertising is to persuade the customer to buy the advertised product and the success of advertising is measured in increase in sales. Information is often given about the product but the inducement is often in the form of an association of nice things connected with possessing the product. Such as 'What do you think your life needs? Passion? Spain' - advertising a holiday in Spain on the television. This television advert for a holiday in Spain begins with the couple washing dishes in the kitchen of their home, then cuts to the woman plate throwing in a restaurant in Spain. Chocolates can be connected with the opposite sex in a sensual way, household cleaning products can be associated with a release from household chores.

Advertising may help to form people's attitude to certain products rather than change them, in that it can act to heighten awareness of a product of which the recipient was not originally aware. In some cases the advertising is so subtle that it can only be effective if you are aware of the product and the advert seeks to remind you e.g. Silk Cut cigarette advertising. When last used before the complete ban, the magazine and poster adverts did not even carry the words 'Silk Cut' or a picture of cigarettes but used an analogy with silk instead, to make the connection. This is really a form of brand identification and not a persuasive communication. United Colours of Benetton adverts are based on images unrelated to the product but with strong shock value. An example of an advert used on hoardings in 1993 shows a new born baby with umbilical cord still attached with the caption 'United Colours of Benetton'. The purpose of this type of advert is presumably to heighten awareness of the brand name through shock. Only where the advertisement gives information with some form of inducement or persuasion to buy the product does it then form a persuasive communication. The Silk Cut advertising is only effective as brand identification. It relies on the target already being a cigarette smoker and aims to bring the particular

brand to their attention. A little information is given but there is nothing in the way of inducement.

Political campaigns and speeches attempt to influence people's voting behaviour by providing information on the present or future policies of the political party represented. The inducement comes in the form of information as to how your life will be improved under the government of that party. Often there is a negative comparison with the opposing party. These political speeches and campaigns are examples of persuasive communications.

There are many forms of persuasive communication produced by insurance companies trying to sell their products. The inducement is in the form of a free gift if the relevant policy is taken out. The information provided is not directly linked with the inducement but it has the required effect on the action of the individual. Although in this case the inducement is a separate entity the package works together as a persuasive communication.

Museums also have used persuasive communications in exhibitions when a particular message needed to be put across to the public for an end result. An early example was in Leicester Museum, which mounted a display aimed at decreasing infant mortality (Lowe, 1916). Information was used in the exhibit which it hoped would reach and inform actual and potential mothers, particularly from the poorer classes. The information was designed to influence their health and hygiene behaviour with their young infants and hence increase survival rates of children. The exhibit showed how poor survival rates were for young infants and used the fear of illness and death of young infants to persuade mothers to adopt good practice in hygiene and feeding.

From this discussion we can see that the essential characteristics of a persuasive communication are (i) the body of salient information contained within the message and (ii) the persuasion or inducement carried with the message, with the intention of persuading the recipient to change his or her behaviour. This inducement may be in the form of a threat of the consequences of not complying with the persuasive

message or it may be in the form of a reward or benefits from taking the action suggested in the communication.

3.4 Effectiveness of a persuasive communication

To be effective, the end result of a persuasive communication must produce a change in attitude toward the behaviour and a behaviour change. Although the end result of the reception of a persuasive communication does not affect whether or not it can be termed a persuasive communication, nevertheless, in producing one the aim of it is to be effective in behaviour change. A great deal of research has been carried out on effectiveness of communications looking at aspects such as: the source of the communication, for instance, whether it is trustworthy or attractive; the structure of the message, whether it is positive or negative, one or two-sided; and the recipient of the communication (summarized in Cacioppo and Petty 1981 chapter 3 & O'Keefe, 2002 chapter 8).

Although there is an intention in a persuasive communication to produce a desired result i.e. that people change their actions as a result of seeing or hearing it, whether a communication is classified as 'persuasive' does not depend on the success of the communication. For example, the leaflet 'Watch your waste' produced by the Department of the Environment acts as a persuasive communication in that information is given on waste and the inducement to produce less waste forms part of the leaflet. The effectiveness of the leaflet in persuading households to reduce the amount of rubbish thrown away will depend on how it is distributed and marketed and whether it is targeted appropriately at the intended audience. Many factors could get in the way of households reducing the amount of rubbish discarded, for instance, a flat owner may not have space to store bottles and newspapers to send to recycling. However, the leaflet is still a persuasive communication with the elements of information and inducement and the result the leaflet produces does not affect the leaflet's standing as a persuasive communication. The necessary elements in the leaflet and in any persuasive communication are the elements of information and inducement.

In the past, investigations of communicative efficacy have involved examining the end result of the receipt of such a communication i.e. whether the attitude has changed or not, without understanding the factors that determine behaviour. Furthermore, little research has been done in the past to investigate behaviour change. The basic paradigm in attitude change research involved three stages:- 1) measure the subject's attitude towards the attitude object (pre-test); 2) expose the subject to a persuasive communication; 3) measure the subject's attitude again (post-test). If there is a change in the desired direction between pre-test and post-test measures, the persuasive communication is judged to have worked (Gross, 1992: 520). However, there are problems in using the approach outlined above. Care needs to be taken to distinguish the effects of the pre-test from the effects of the persuasive communication. By testing the subjects at the start, their awareness may already be heightened to the contents of the persuasive communication and they may give different results in a post-test from a group who had not been initially pre-tested.

McGuire (1969), on the other hand, sees the dependent variable of 'attitude change' as being too vague and proposes that we should be seeing if the recipient has: 1) attended to the message, 2) comprehended the message, 3) yielded to it, 4) retained it and 5) acted as a result. He proposes that there needs to be not just a change in attitude but also a change in behaviour. However, his description does not contain a monitor for an attitude change element but it does show a monitor of an element of behaviour change in '5) acted as a result'.

Using the description of McGuire, the prohibition notice 'Keep off the stones' could have the desired effect of the recipient acting, by keeping off the stones, as a result of attending to the message, and would therefore be an effective persuasive communication under his definition. But it may not have changed the person's attitude as there is no attempt to explain or persuade why the reader must keep off the stones. Given another set of stones, without the message, it may be forgotten or the context not recognised as similar and the action of the original recipient may be different. Compliance with a prohibitive notice is not the same as being induced to act by a persuasive communication. For a persuasive communication to be effective there needs to be an enduring change in attitude as well as recording a behaviour

change.

Whereas all the elements of McGuire's description are necessary in reacting to a persuasive communication, when compared with the Ajzen and Fishbein TRA his analysis does not show if the message has acted on the beliefs and influenced the attitude and thereby changed the behaviour. The recipient may just have complied in that particular instance without a change in beliefs or attitude. So his method is not really testing whether a persuasive communication is effective in changing behaviour unlike the TRA which investigates into the process behind the action.

Effectiveness of persuasive communications is a problematic area in which to compare results and elucidate what makes a persuasive communication effective, simply because the measures of effectiveness used in different studies vary. Indeed researchers' views vary as to whether an effective persuasive communication results in attitude change or behaviour change. This study takes the position that the *key to effectiveness* is whether *attitude and behaviour are changed.*

The early research into persuasive communications has identified a number of factors which influence its effectiveness but without identifying the underlying mechanism of behaviour change. Laswell (1948) states that in order to understand and predict the effectiveness of one person's attempt to change the attitude and behaviour of another, we need to know 'who says what to whom and with what effect'. Developing this further, Hovland and Janis (1959) in the Yale approach (fig 3.1) in contrast to McGuire show that we need to study; 1) the source of the persuasive communication, i.e. the communicator, 2) the message itself, 3) the recipient of the message or audience, 4) the situation or context. Any persuasive communication will have a particular target audience and the source can be selected to have the desired effect on that audience. The language of the message may also vary but the basic construct of information and persuasion will still prevail.

In order to be able to generalize from the models of Laswell, Hovland & Janis, and McGuire and construct a successful persuasive communication from their findings for this research, it is necessary to know what type of source, message and context

are effective in producing behaviour change. Here research gives conflicting results depending on the situation and behaviour change being investigated. There are many variables within the source, message structure and audience, and interactions between them, which can be studied with respect to their effect on the success of a persuasive communication. Some of these aspects are discussed below.

3.4.1 The effect of an information source on a persuasive communication

Gross (1992: 520-522) summarizes the research on the effectiveness of the source under four headings:-

- Status and credibility
- Attractiveness
- Trustworthiness
- Non-verbal behaviour

<u>Status and credibility</u>

Gross states, 'In general the more expert the source, the more likely we are to be persuaded'. Hovland and Weiss (1951) found that American subjects were more convinced of the truth of an article on antihistamine drugs when told the source was a medical journal, than when it was stated as a mass-circulation magazine. However, when the subjects were tested three-four weeks later, the original differences between different sources had greatly decreased. Hovland and Weiss postulated that the identity of the source becomes detached from the message over time and in fact the important part of the persuasive communication is the *content* and *not* the *source*.

<u>Attractiveness</u>

'A source which is charming, humorous and has a pleasant manner is more persuasive (everything else being equal) than one who does not have these qualities. An unattractive or unlikeable source might produce a 'boomerang effect' whereby the audience responds by adopting attitudes which are contrary to those being advocated.' (Gross, 1992: 521). In the USA, politicians devote considerable effort to enhancing their personal appeal to voters. Chaiken (1979) conducted a study where

the messages concerned not serving meat at breakfast and lunch in university dining halls. He found that people who were physically attractive persuaders induced significantly greater persuasion than unattractive persuaders. However, Maddux and Rogers (1980) found that the persuasiveness of a message arguing that people only needed four hours sleep a night was not influenced by the communicator's physical attractiveness. A possible mechanism whereby the attractiveness of the communicator makes a difference is that a communicator's physical attractiveness influences the receiver's liking for the communicator, which in turn influences the success of the persuasion. Nonetheless the effect of physical attractiveness on the ability to persuade seems to be rather varied.

Trustworthiness

The trustworthiness of the source is linked to the perceived intentions and motives of the source. For instance, the trustworthiness of politicians has been recently questioned over the decision to support the war in Iraq. The motives have been seen by the public as in the interests of the government rather than the country. Other influences on trustworthiness include whether the message is delivered direct or overheard. 'A source which is overheard is less likely to be suspected of ulterior motives and to this extent is more trustworthy' (Gross, 1992: 522). Also the self interest shown in the message can be important. A source who advocates a message which is contrary to his own self-interest can also be very effective (O'Keefe, 2002: 187).

Non-verbal behaviour

The non-verbal behaviour of a source can influence whether the source is perceived as being attractive and trustworthy. The distance a source leaves between him or herself and the receiver is particularly important. Abelsen and Zimbardo (1970 in Gross, 1992) advised campaigning candidates and door-to-door canvassers to keep a distance of four to five feet, a respectful distance, when talking to strangers.

3.4.2 Message structure

The early research has not given much indication as to the structure of a message

which will be effective. For instance, McGuire (1968) believes that implicit messages may be more effective if the recipient is capable of and likely to draw the conclusions; but for recipients of low intelligence, and/or motivation, explicit messages may be preferred. Although a persuasive communication is set up with a target audience in mind, this information from McGuire on the explicitness of the message is only useful if the type of recipient is known, as message type and recipient are dependent upon each other, according to McGuire.

Level of emotional appeal has also been suggested as an important factor in effectiveness of a persuasive communication. However, a high fear message has been found to sometimes increase persuasion, sometimes to decrease persuasion and sometimes to have the same effect as a low fear message, (Ajzen & Fishbein, 1980: 228). These inconsistent results show that it is difficult to draw a conclusion as different contexts give different results.

The order of presentation of a message and whether the message is one-sided i.e. only giving the argument; or two-sided i.e. mentioning and explicitly refuting the counter argument can give different results. Moreover, when two-sided the order of presentation of the message has also been found to give inconsistent results. 'Variations in order of presentation sometimes produce recency effects, sometimes primacy effects, and sometimes no effects at all', Ajzen and Fishbein (1980: 222).

3.4.3 Audience factors

The influence of the message recipient on the effectiveness of the persuasive communication has been researched in some detail and again provides conflicting results. Message processing is thought to be affected by the message recipient's motivation and ability. 'Personal relevance is one factor known to affect motivation to attend to the arguments addressed in a persuasive message' (Petty and Cacioppo, 1986).

A subject's prior knowledge may affect relevant thinking about the issues presented, and also acceptance of the messages presented. Also suspected of affecting the

ability to process a persuasive communication is a subject's educational background. (Simpson et al, 1994: 228).

3.4.4 Other aspects

In order to produce an effective persuasive communication other aspects of the message can be studied. Such aspects as whether humour is used in the message can have varied effects. Humour can enhance the audience's liking of the communicator and have a positive effect or it can decrease the audience's liking of the communicator, making him or her appear untrustworthy and have a negative effect (O'Keefe, 2002: 190). Relative effectiveness of ordering the arguments in a message in terms of importance of argument has been studied by a number of researchers. The climax order gives the most important arguments last. The anticlimax order gives the most important arguments first. There seems to be little difference obtained to the overall persuasive effects by varying the order. (O'Keefe, 2002: 216). A number of studies have examined the persuasive effects of using an example, or case history, versus a statistical summary which provides a quantitative summary of a large number of instances. Koballa (1986) found that the case study was much more persuasive than the statistical summary when presenting information about a science curriculum to pre-service high school teachers. But other studies have found no difference in persuasiveness between examples and statistical summaries e.g. Krupat et al (1997) whereas Baesler & Burgoon (1994) found statistical summaries more persuasive than examples.

Thus, there are conflicting results as to what will make an effective persuasive communication with varying results obtained on effects of the source, the message and the receiver, with interactions between these different aspects. There is also a difference of opinion as to whether the end result of an effective persuasive communication is a change in attitude or in behaviour. Indeed some researchers' views of attitude change are so broad as to cover behaviour within their definition. For instance, the Yale approach to communication and persuasion shows the attitude change covering opinion, perceptions, affect and action, see Fig 3.1.

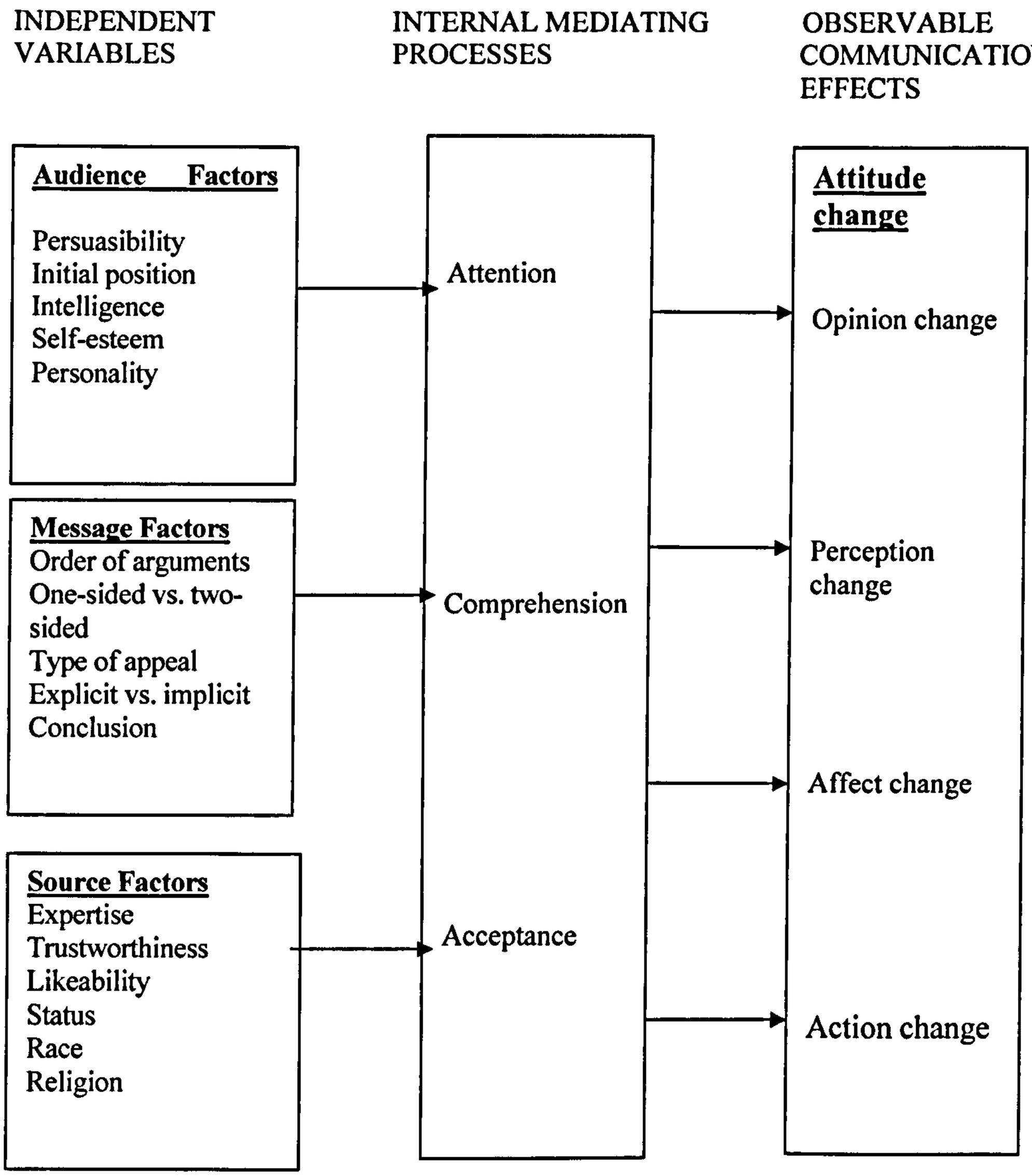


Figure 3.1 Yale approach to communication and persuasion (Based on Janis and Hovland, 1959, in Ajzen and Fishbein, 1980: 220).

As described above, the Yale approach is based on the - 'who says what to whom with what effect'. The effect (attitude change) is influenced by variations in the characteristics of the source of the communication (who), the message (what) and the audience (whom). The effect also depends on the extent to which it is attended to, comprehended and accepted. Furthermore, the effect of attitude change is broad, subsuming opinion change, perception change, affect change and action change. With such a broad definition of effectiveness it is difficult to assess what the criteria

are for a successful persuasive communication using this model.

3.4.5 Elaboration Likelihood Model

The work of Petty and Cacioppo (1986) on the Elaboration Likelihood Model (E.L.M.), a general theory of attitude change, provides a different framework for organising, categorising and understanding the basic processes underlying the effectiveness of persuasive communications. They postulate two distinct 'routes to persuasion'. The first type of persuasion occurs as a result of a person's consideration of the *information* presented in support of an advocacy (central route). The other type occurs as a result of some simple cue in the persuasion context, e.g. an attractive source (peripheral route). They suggest that the first type is more enduring than the latter. Petty and Wegener (1998: 367) summarise research which supports the notion that conditions which foster people's motivation and ability to engage in issue-relevant thinking are associated with increased persistence of persuasion such as self-generation of arguments, providing increased time to think about a message and increasing message repetition. Cook and Flay (1978) review attitude change studies measuring persistence and conclude quite pessimistically that most of the laboratory studies on attitude change tended to find very little persistence (in Petty and Wegener, 1998: 367). However Petty and Wegener maintain that 'current research is compatible with the view that when attitude changes are based on extensive issue-relevant thinking they tend to endure (Petty and Wegener, 1998: 367).

The E.L.M. specifies the major ways in which variables can have an impact on persuasion, either as a persuasive argument, or as a peripheral cue. It provides a simplifying and organizing framework that may be applied to the source, message, recipient and context variables. However, the E.L.M. does not investigate the process of attitude and behaviour change and the factors which determine behaviour, it only approaches the different variables involved and not the underlying process. Regarding the message itself, Petty and Cacioppo admit that they do not know what makes a message persuasive.

'One of the least researched and least understood questions in the psychology of persuasion is - what makes a message persuasive? Thousands of studies and scores of theories have addressed the question of how some extra message factor affects the acceptance of a particular argument but little is known about what makes a particular argument (or message) persuasive in isolation.' (Petty and Cacioppo, 1986: 31)

Ajzen and Fishbein (1980: 221) maintain it is the *information* that is the key to the persuasion process, '*The effectiveness of the message depends in large measure on the nature of this information,'* (emphasis added). Ajzen and Fishbein (1980) suggest two reasons why what they term the 'traditional' approach to attitude change has produced conflicting results. The first reason is that the term 'attitude' has not been defined exactly by all researchers. In some cases, 'attitude' may be being used to refer to not just a person's affective feelings but also their cognitions or beliefs about the object. Also 'attitude' is being used to refer to conations or behavioural tendencies and actions with respect to the object, as can be seen by the Yale approach to communication Fig 3.1. Although these variables are interrelated they have very different determinants.

The second reason that Ajzen and Fishbein give for the value of content is that the variables of source, message and receiver are probably not understood in isolation from the content of the message, (see McGuire, 1968). A change in content of a message could give a very different effect on source credibility. Indeed, investigators have neglected the role played by the *content of the message*. There are cases of investigations where a change in source credibility had no effect on the amount of attitude change (e.g. McCroskey, 1970) indicating that the *content of the message itself* was sufficient to produce the desired attitude change.

Simpson et al, (1994), however, maintain that research based on the Elaboration Likelihood Model (Petty and Cacioppo, 1986) shows that the message *recipient* is the key to persuasion.

'The recipient can objectively or in a biased manner process the

arguments presented in a persuasive message or rely on peripheral clues in the persuasive context. Any variable that tends to reduce one's motivation or ability to process issue-relevant arguments tends to increase the importance of peripheral clues associated with the message, source, recipient or persuasive context. Conversely, when one's motivation or ability to think about issue relevant arguments is high, peripheral cues become less important determinants of persuasion.' (Simpson et al, 1994: 228)

However, this argument has failed to take into account the importance of the content of the message. If the effectiveness of a persuasive communication is totally dependent on the recipient, there is no way of predicting what will make an effective communication because the recipient can process the communication in a number of different ways, including not thinking about the issues and being persuaded by some peripheral cue. The ELM suggests that recipients will vary in how much they think about a topic. The Elaboration Likelihood Model does not take into account the factors that determine behaviour and the importance of influencing beliefs underlying the attitude toward the behaviour. Also the effectiveness of a persuasive communication must consider the content of the communication, as this is a variable which can be controlled, whereas the amount a recipient engages with the communication in topic-related thinking cannot be controlled.

3.4.6 Summary on effectiveness of a persuasive communication

Where investigators have selected dependent measures, these have varied depending on the issue under consideration. For instance, McCroskey, (1970) varied the message by, in one case, providing strong supportive evidence for the arguments, and in another case providing minimal evidence. A variation in source credibility only had an effect on attitude change when minimal evidence was provided. When the message contained strong supporting evidence there was no difference in attitude change with different sources. The conclusion to be drawn is that the information in the message was sufficient to produce change in attitude (Ajzen and Fishbein, 1980: 223). It is difficult to draw comparisons between studies and general conclusions,

because the dependent measures are only relevant to any particular study. For example, the non-verbal behaviour of a source is only relevant when the message source is a person and not a piece of literature. If the content of the persuasive communication is key, then the message can remain stable and produce a desired attitude and behaviour change irrespective of the source.

Thus it appears that much of the early work on the effects of persuasive communications has attempted to produce changes in behaviour without understanding the factors that determine behaviour. It is assumed that if receivers yield to the messages then they will change their attitudes and behaviour without understanding the process which brings about behaviour change. The early work is not based on any systematic theory of behaviour change.

3.5. Ajzen and Fishbein approach to persuasive communication

In contrast, the approach adopted by Ajzen and Fishbein is based on a systematic theory of behaviour change and it provides a more helpful indication as to the type of persuasive communication which will achieve success in changing behaviour. Their model of behaviour change links the person's intention to perform, or not perform, the behaviour as an immediate determinant of the behaviour, i.e. something which immediately affects the performing of the behaviour. (Ajzen and Fishbein believe that behaviour does not just happen but is under volitional control.) Intention, in turn, is determined by a) the person's attitude toward performing, or not performing, the behaviour and b) the person's perception of the social influence or normative pressure to perform or not perform the behaviour, (subjective norm). Both the attitude and normative components of a behavioural decision are based on sets of specific beliefs held by the individual. As explained earlier, behaviour change is brought about by producing changes in these beliefs (section 2.2).

According to Ajzen and Fishbein, influencing beliefs about the consequences of performing a behaviour can produce changes in the attitude toward the behaviour. By influencing beliefs about expectations of specific referents, i.e. the social pressures to behave in a particular way brought about by people who have an

influence, we can also affect the subjective norm. Ajzen and Fishbein suggest two strategies with regard to changing beliefs; 1) to influence some of the beliefs that are salient in the subject population, (by salient they mean pre-existing beliefs relevant to the behaviour being monitored), 2) to introduce novel, previously non-salient, beliefs.

In order to construct a persuasive communication the relevant primary beliefs of the subject or target population have to be determined with regard to the behaviour to be changed. Then a set of arguments have to be constructed which will influence the primary beliefs about the performance of the behaviour. Ajzen and Fishbein (1980: 224) give, as an example, the communicator who would like receivers of his message to donate blood in the United States of America. Using the Ajzen and Fishbein approach, he would assess the salient beliefs held by his target audience, obtaining a set of behavioural beliefs concerning their perceived consequences of donating blood (e.g. 'donating blood is painful') and a set of normative beliefs with respect to this behaviour (e.g. 'my spouse thinks I should not donate blood'). In constructing his, or her, message the communicator could attempt to change any one of these salient beliefs in the relevant direction, i.e. in an attempt to produce more favourable attitudes toward the behaviour he or she could try to decrease the receiver's belief that donating blood is painful. Alternatively, he or she could try to induce a more favourable subjective norm by increasing the belief that their spouses think that they should donate blood. If the communicator wished to introduce previously non-salient beliefs he might induce the receivers to believe that donating blood would assure them of access to the blood bank. Assuming that receivers positively evaluate having access to the blood bank this communication should produce more favourable attitudes to donating blood.

The effects of a message can be direct, in that it can produce acceptance of and yielding to the arguments it contains, or it may have indirect effects by an impact on primary beliefs not explicitly mentioned in the communication. According to Ajzen and Fishbein, to be effective, the persuasive communication must change a sufficient number of primary beliefs to influence either the attitude toward the behaviour or the subjective norm.

The model of Ajzen and Fishbein gives a clear strategy to show how the determinants of the behaviour can be influenced in a persuasive communication. This model has been successfully used in a study by Strader and Katz (1990) on the effect of a persuasive communication on beliefs, attitudes and career choice, as well as many other studies (e.g.Koballa, 1988, Crawley & Black, 1992, Crawley & Coe, 1990). In the Strader and Katz study:

> 'Fishbein's Theory of Reasoned Action was used to formulate a persuasive communication in an attempt to influence unclassified American College students' beliefs, attitudes, intentions, and behaviours regarding signing up for a career as a registered nurse. A two-stage cluster sample was used to assign 90 male and female students to either an experimental or control group. After persuasive communication exposure, the experimental group showed a significantly more positive change in beliefs, attitudes and intentions than did the control group, exposed to a neutral message.' (Strader & Katz, 1990: 141)

The message they used had a positive appeal linking signing up behaviour for a nursing career with positive consequences. Strader and Katz have shown that by using the Theory of Reasoned Action, and researching the beliefs underlying the attitude toward the behaviour, they were able to produce a persuasive communication with a positive appeal which acted on the underlying beliefs and was successful. A persuasive communication is likely to be more effective if it is based on the model of behaviour change of Ajzen and Fishbein (1980).

3.6 Summary

A persuasive communication is a communication which consists of information and some form of inducement or persuasion. The inducement may take the form of a reward, or a threat, or fear of the consequences if compliance does not take place. To be effective a persuasive communication should contain information linking the

behaviour to various positive or negative outcomes, or it should provide information about the expectations of specific referents (people close to the subject). The strongest message to emerge from research would suggest that the content of the communication is the key to its success. Other factors such as the source of the message or communication come secondary to the content. According to Ajzen and Fishbein, as a general rule, a message consists of a set of arguments and factual evidence to support these arguments. When the aim of the message is to change behaviour, the message will often include one or more recommended actions. The communication should also target the beliefs about the behaviour following the model of Ajzen and Fishbein. An effective persuasive communication can only be judged effective if it results in a positive change in behaviour. The next chapter will describe the use of a persuasive communication in an attempt to change the behaviour of visitors to a small botanic garden in London.

Chapter 4 An investigation into behaviour change at Chelsea Physic Garden

4.1 Introduction

Botanic Gardens, like zoos and museums, are in an ideal position to influence visitors' attitudes and change behaviour towards the environment and conservation, yet there is very little evidence of their engaging with visitors in this way. Indeed the Botanic Gardens Conservation Strategy (WWF, IUCN, 1989) recognises the potential of gardens: 'The botanic gardens and arboreta of the world offer unique opportunities for the education of a vast public.' Further emphasising botanic gardens important role, in 2002 the Global Strategy for Plant Conservation stated as an objective the need to 'articulate and emphasize the importance of plant diversity...and the need for its sustainable use, in order to mobilize necessary popular and political support for its conservation and sustainable use.' (Sec. Conven. Biol. Diversity, 2002). Gardening behaviour in home gardens is an area where people can be encouraged to act in an environmentally-friendly way and there is a real need for behaviour change, particularly in activities such as avoiding using peat and composting waste. People visiting botanic gardens are likely to be interested in plants and gardening, so the Chelsea Physic Garden was an ideal place to investigate the possibility of influencing people's attitudes and behaviour towards environmentally friendly gardening.

The Garden is a 3.5 acre site beside the embankment in Chelsea, London. It is open Wednesday and Sunday afternoons from March to October. It has a strong tradition of teaching, having been set up by the Society of Apothecaries in 1673, and it maintains an interest and expertise in medicinal plants. The Garden has a tearoom and exhibition space and one entrance and exit (see map Appendix 1). This research study seeks to show that it is possible to change the attitude and behaviour of visitors to Chelsea Physic Garden by the use of a persuasive communication and thereby demonstrate that botanic gardens, zoos and museums can do more than just raise awareness of issues.

4.2 Research Methodology

In order to influence the beliefs of visitors, with the aim of ultimately changing their gardening behaviour to being environmentally-friendly, an exhibit containing the persuasive communication on environmentally-friendly gardening was set up in a small conservatory in Chelsea Physic Garden; with additional information boards sited in the adjoining room where teas were served.

In using the Ajzen and Fishbein model as a guide to the present study, this model indicates that if a botanic garden is to influence attitudes and behaviour towards conservation issues and, in particular, the way people garden, the material on display must act on specific beliefs related to the consequences of performing behaviour oriented towards conservation. The behaviour under investigation in this study is the conservation behaviour of people in their own gardens, for gardens make up almost 3% of land area in Britain (Owen and Owen, 1975). As more land is swallowed up in development, gardens are becoming increasingly important as havens for wildlife.

> 'There are around 15,000,000 gardens in Britain and they are a major factor in the survival of species like the common frog. With intensive farming practices making the countryside more hostile to wildlife, gardens are also important for a wide range of other species including bees, dragonflies and many species of bird.' (English Nature,ww.english-nature.org.uk, 2003).

If people could adopt management practices in their own gardens which are 'environmentally-friendly', such as the use of compost heaps, a garden pond, a range of trees and shrubs providing nesting sites for birds, and pollen and nectar for insects, (Baines, 1984), then they would be contributing to the conservation of the natural environment and wildlife in Britain.

On the other hand, some practices in home gardens can actively contribute to habitat destruction and loss of plants from the wild. One such practice is that of buying bulbs or horticulturally valuable plants imported directly from the wild, (Read,

1989). In countries such as Turkey, local people generate income by digging up and selling wild plant bulbs. In some cases so many bulbs have been dug up and sold that the local people have wiped out some species in the wild e.g. *Narcissus moschatus* in Spain, (Read, 1989). Many of the bulb species can be artificially propagated in nurseries, thus preserving the wild populations. A number of bulb suppliers now label their bulbs to show that they have been propagated in nurseries. It is also possible to tell by inspection of some bulbs whether they are from a wild source or nursery grown. The latter tend to be much more evenly shaped and free from damage. Also the use of peat in home gardens contributes to the destruction of wild habitats. There are peat substitutes in the form of coir, woodchip and garden compost. Peat is a non-renewable resource; its removal from the wild is not replaced in historic timescales, (Howell, 1991). If gardeners changed their behaviour to only buy artificially propagated bulbs and compost manufactured without peat, the market for these products would collapse and it would become unprofitable to dig up bulbs from the wild or extract peat.

In applying the Ajzen and Fishbein model to change behaviour towards conservation it is necessary to change beliefs:

> 'By influencing beliefs about the consequences of performing the behaviour we can produce changes in the attitude toward the behaviour, and by influencing beliefs about the expectations of specific referents we can affect the subjective norm.' (Ajzen and Fishbein, 1980: 223-224).

According to the model, a change in the attitude toward the behaviour or a change in the subjective norm, i.e. what other people think about my performing the behaviour, will have a positive influence on the intention to perform the behaviour. In order to influence behaviour, people have to be exposed to information which will produce changes in their beliefs. The changes in beliefs will then act on their attitudes towards the behaviour; this will then alter their intention to behave in a particular way and ultimately lead to a change in behaviour.

An example of a belief which could be influenced by information is the belief that buying wild collected plant bulbs will deplete the numbers growing in the wild, or only buying bulbs which have been propagated in nurseries will help protect the wild populations. Bulbs are indeed not the only problem in collection from the wild; the natural populations of plants such as cacti, sundews and Venus-fly-traps are also subject to depletion by collection from the wild.

A persuasive communication which could be used to influence the belief and the attitude toward the behaviour of buying bulbs could introduce information and questions in the following way:

1. Where do the bulbs come from which we buy to grow in our gardens?
2. Not all bulbs are propagated in nurseries; some are dug up from the wild and imported to be sold.
3. Bulbs removed direct from the wild populations can severely reduce the number of plants growing in the wild.
4. You can help protect wild populations by not buying wild collected bulbs.

4.3 The persuasive communication at Chelsea Physic Garden

4.3.1 Methodology

The persuasive communication used in Chelsea Physic Garden consisted of a series of recommended actions and explained the positive outcome, or benefits, from undertaking these actions. The behaviour change which was sought was that of gardening in a wildlife-friendly manner. Specific wildlife-friendly actions were targeted including: buying bulbs which are artificially propagated; using alternatives to peat; using organic gardening methods and using a compost heap. By introducing the belief that our gardens are important habitats for wildlife, and the specific actions outlined, it is hoped that it will lead to behaviour which is wildlife-friendly being performed.

Once the beliefs have been influenced by a persuasive communication, this should

then affect the attitude toward the behaviour. To investigate the attitude toward the behaviour the respondent was asked, for example, to rate their answer to the question, 'my buying wild collected bulbs is...' on an evaluative scale as follows:

good: : : : : :bad

extremely, slightly, neither, slightly, extremely

If the persuasive communication were effective then the attitude should appear on the 'bad' end of the scale and this attitude would affect the intention to perform the behaviour. In order to measure the intention toward the behaviour a question such as the following was asked of the respondent.

"My intention not to buy wild collected bulbs is.."

likely: : : : : : unlikely

extremely, slightly, neither, slightly, extremely

The influencing of the beliefs about the behaviour should affect the attitudes towards the behaviour. This should then lead to a positive intention to behave in this way, shown as likely on the scale, and subsequently for the behaviour to take place i.e. to deliberately avoid buying wild collected bulbs.

4.3.2 The Exhibit

A display of endangered plants and display boards, with large photographs and the persuasive communication on environmentally-friendly gardening, was set up in a small conservatory in Chelsea Physic Garden and in the adjoining room where teas were served. The aim was to influence the beliefs of visitors, with the aim of ultimately changing their gardening behaviour to an environmentally-friendly one. Visitors to the Garden could enter either through the tea room or conservatory, seeing the display boards before or after the living plants. There were drawbacks in this location in that being able to view the exit from the entrance, and the draw of the tea room, caused a small proportion of people to walk through the exhibit without

viewing it. This has been noted by other museum exhibition researchers as 'the exit effect' (Melton, 1972 in Durbin Ed. 1996).

The exhibit used the problems facing endangered island plants (mainly those in the Mediterranean) as a theme. Since it is a reasonable assumption that visitors to botanical gardens are interested in plants, the exhibit was designed to use this interest to capture their attention. By highlighting the exhibit location on the map issued to entering visitors to indicate 'points of interest', the exhibit was made an integral part of their visit (a copy of the map is included in Appendix 1).

The unique microclimate of the Garden, sheltered by the walls of tall London houses, creates an environment in which tender plants are able to thrive. One of the important tender plant collections held by the Garden is of endemic island plants; in particular there is a large collection of plants from the Canary Islands. Large collections of rare and endangered plants from this area have been built up and plants have been propagated and distributed to other botanic gardens. Many of the plants in the Garden's collection of island plants are very attractive, particularly when in flower. The display on endangered plants was able to link the educational theme with an attractive display of plants by making use of the Canary Island collection, thereby attracting visitors' interest and educating them at the same time, (see picture Appendix 6). The conservatory was used to display the actual endangered plants with information given on the plant label as to the reasons for the plant being endangered and the level of threat, (using categories outlined in the IUCN Plant Red Data Book, (Lucas and Synge, 1978), see Appendix 4 and 6. Also in the conservatory was a small display of economic plants with information on their uses. The aim behind this display was to make people aware of the importance of plants in our lives and the uses we make of plants. Examples included medicinal plants, food plants and fibre plants. In the main room, photographs of the endangered plants and scenes of habitat destruction were accompanied by information making the following main points:-

1. the specific conservation risks affecting endemic plants on islands;
2. the reason plants need to be conserved;

3. what you can do about plant conservation;
4. the amount of land in private gardens and what you can do for conservation in your garden;
5. the link between this behaviour and a positive outcome - if we all carried out some of these activities we are more likely to be giving future generations an environment fit to live in.

The activities listed included buying bulbs which are artificially propagated rather than dug up from the wild, using alternatives to peat, using a compost heap and recycling organic household waste (see Appendix 2 for text of exhibit).

The beliefs that were targeted through the persuasive communication included:-

- the importance of plants for their products such as food and medicines;
- the need for conservation of plants;
- the importance of gardens in conserving plants and other wildlife.

Copies of the U.K. government Department of the Environment booklet, '*Wake up to what you can do for the Environment*' were placed in the exhibit for people to take away. This had a similar message, showing what actions people could take individually and how these would help the environment (see appendix 3). This booklet gave visitors further information on activities they could carry out to help conserve the environment. The booklet contained information reinforcing the message in the exhibit. It also gave information which could be read at more leisure at a later date.

The design of the exhibit was partially influenced by the space available. It had to be designed in such a way as to make sense whichever way the visitor walked through it. This was achieved by designing the exhibit as two separate and complementary parts. The display in the conservatory reinforced the importance of plants in our lives by showing living examples of those of economic use and those plants which are under threat. The text in this part of the exhibit was minimal, consisting of labels on the plants to explain the particular threat to the plant (see Appendix 4 for examples).

The display in the main room reinforced the message with photographs of selected plants under threat and photographs of the threats themselves such as the destruction of vegetation by goats and the destruction of habitats by building development along the coast. These showed the effect of the threat on the habitat. This was then followed by information on what the visitor could do for plant conservation (see Appendix 2).

In order for the exhibit to influence behaviour the key messages must be memorable. In designing the exhibit this principal was borne in mind. Results from studies such as Bitgood et al (1986) suggest that the more information the visitor is exposed to, the less retention will occur. Therefore, information was deliberately kept to a minimum and was put together in small sections (four-five lines per paragraph) with plenty of illustrative material. The information was organized in a sequence which built up the story through themes.

The exhibit was designed to convey a specific message or persuasive communication. Research on learning in leisure settings, such as museums and galleries, has shown that visitors come motivated to explore the information they want at their own pace (Koran et al., 1983). Informal settings are sensory stimulating and they encourage the visitor to be in a leisure mind-set. The visitor in the leisure setting is under no obligation to learn, and indeed many studies have shown that the average visitor in a recreation environment spends little time reading text, looking at exhibits or processing information given to them (Koran et al., 1983; Miles, 1993; Bitgood et al., 1988). However McManus working at the Natural History Museum showed that visitors do in fact read labels and interact with exhibit texts. Her research with visitors shows that museum visitors read, depend upon, and use exhibit texts, (McManus, 1989). McManus' research covered 583 visitor groups at five exhibits in the Natural History Museum, London. Almost half of the groups were observed as not having any member seen to read an exhibit text. At the time of the observations at four of the five exhibits, transcripts were made of recorded conversations. The transcripts indicated that more of the groups than expected were in fact reading the exhibit texts. More than eight out of ten groups showed direct evidence of having a member or members read exhibit text through the transcripts.

> 'Despite the high percentage of groups visually observed as not containing readers, the transcripts indicated that more than expected were, in fact, reading groups and that despite appearances people do read exhibit texts.' (McManus, 1989).

In fact groups were reading and interacting with the texts and with each other. McManus found that visitors interpret texts in an interactive manner - just as they interpret each other's utterances.

Similarly, research by Stevenson (1991) has shown that visitors to an interactive science exhibition (Launch Pad) attend to the exhibits for a considerable proportion of their time in the gallery. Furthermore, their visits have a long term impact with evidence of visitors thinking about what they were doing and able to recall much of what had happened during their visit. Although a visit to Chelsea Physic Garden is not the same as an interactive science exhibition, visitors do interact with the plants, so parallels can be drawn. The display is not completely static because the plants are alive and can be touched and smelled. Visitors also come because they are interested in plants and are therefore receptive to information.

A piece of information which supports the notion that exhibits can be used to carry persuasive messages comes from a study of the effectiveness of interpretive services provided in visitor centres by Dartington Amenity Research Trust (1978). The study showed that the exhibitions in the centres were effective in increasing the knowledge of visitors. The experience for the majority of visitors was both informative and enjoyable.

> 'Interpretation in visitor centres can increase the visitor's understanding of the site or resource being interpreted.' (D.A.R.T., 1978: 66).

The literature supports three motivational constructs that influence cognition which encourage learning in the recreational setting; visitor perception, visitor involvement

and perceived control (Carlson, 1994). Visitor perception influences early stages of participation and the amount of mental effort put in (Salomon, 1983). Interactive devices or hands-on exhibits are one way of increasing involvement.

> 'The more that the individual perceives that they are in control of the learning environment, the greater the likelihood that they are in a mindful state', (Langer and Imber, 1979).

In order to increase visitor interest and involvement, plants whose uses were familiar to the majority of visitors were displayed in one section of the Conservatory i.e. tea, coffee and orange. Also the photographs of endangered plants and habitat destruction in the exhibit were linked with the living plants displayed in the Conservatory. The living plants were used to stimulate interest, as it was the living plants that visitors to a botanic garden had come to see, these then linked with the messages visitors were intended to read. Some proof that some visitor involvement and perceived control took place was seen by the number of copies of '*Wake up to what you can do for the environment*', available in the Conservatory, that were taken for further reading. Also involvement was noticed from the focus of conversations of visitors passing through.

4.4 Data collection

4.4.1 Choice of method

The aim in setting up the exhibit in Chelsea Physic Garden was to increase awareness of visitors to nature conservation and alter attitudes and behaviour towards nature conservation in their own gardens.

Following the methodology of Ajzen and Fishbein, that behavioural change is ultimately the result of changes in beliefs. The general belief that the exhibition targeted was the belief that undertaking wildlife-friendly gardening behaviour could aid conservation. A change in this belief could influence the attitude toward wildlife-friendly gardening and through the attitude, the intention to garden in a wildlife-

friendly manner, Fig 4.1. The specific beliefs the exhibition targeted were those of the need for conservation of plants; the importance of gardens in conserving plants and wildlife; that buying of artificially propagated bulbs would help nature conservation; using alternatives to peat would aid nature conservation; and using organic gardening methods and using a compost heap were all activities which would aid nature conservation.

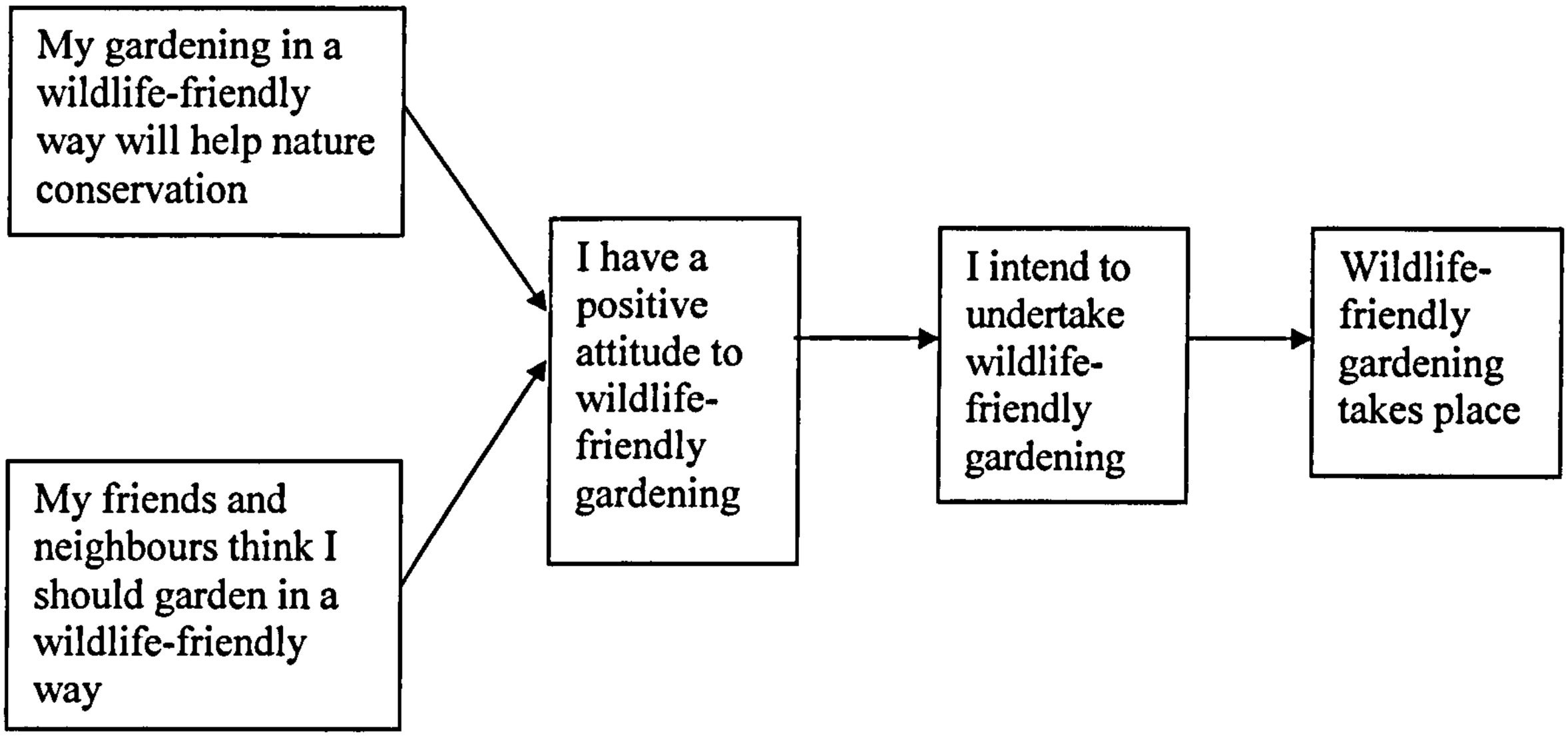


Figure 4.1 Diagram to show how influencing beliefs will alter gardening behaviour based on the Ajzen and Fishbein model

There are four aspects which can be investigated to see if the exhibit was successful. 1) Did the visitors attend to the message? 2) Did this alter attitudes towards plant conservation? 3) Did visiting the exhibit alter the behaviour of visitors towards nature conservation? 4) Did visiting the exhibit change the beliefs underlying the attitudes and behaviour towards wildlife friendly gardening?

Firstly, did visitors attend to the messages? Of the messages portrayed in the exhibit the following were the key ones for visitors to have attended to:-

a. That plants were under threat.
b. The importance of conserving plants.
c. What people could do to aid conservation of plants.
d. What people could do in their own gardens to help conserve plants.

Any or all of these messages could be investigated to test whether visitors had attended to the messages. If visiting the exhibit increased awareness of any of these aspects, then this would show that the persuasive communication had been attended to and the information targeted at people's beliefs had been assimilated.

Secondly, did visiting the exhibit alter attitudes of visitors towards plant conservation - resulting in positive attitudes towards their own behaviour of conserving plants and, in particular, towards what they could do in their own gardens?

A change in visitors' attitudes toward the behaviour of conserving plants and their own gardening practices would indicate some success for the persuasive communication. In some instances it may not be possible for a change in behaviour to be carried out immediately, but a change in attitude toward the behaviour gives the *possibility* of a subsequent behaviour change.

Thirdly, did the exhibit alter the behaviour of visitors towards conservation of the environment and plants? Did they carry out any of the activities mentioned in the exhibit in their own gardens?

Any evidence of behaviour change would indicate success for the persuasive communication. However direct evidence of a change in behaviour is difficult to observe, and hence this study could only depend on reported behaviour. The greater the number of people who report a change in behaviour, the greater will be the success of the persuasive communication. If there are no reported behaviour changes then it does not necessarily mean that the persuasive communication was a failure, there may be circumstances which have meant that behaviour changes are not possible. If there are no changes in behaviour but attitudes towards the behaviour have altered then the persuasive communication has shown some degree of success.

Finally, did the exhibit alter the beliefs underlying the attitudes and behaviour towards wildlife-friendly gardening?

It is the changes in the beliefs underlying the attitudes and behaviour which leads to the ultimate change in behaviour. If it was not possible to record the behaviour changes, any record in changes in beliefs would at least indicate some success in the persuasive communication messages of the exhibit.

In setting up the exhibit and testing its effect, the work of Ajzen and Fishbein (1980) has been used to guide the study, but this study is not a test of the Theory of Reasoned Action. Rather, the model has been used to design the persuasive communication that is attempting to change behaviour. The beliefs underlying the attitudes and intentions to perform the behaviour towards conservation in visitors' own gardens have been assessed and targeted in the exhibit.

4.4.2 Use of questionnaires

In devising a method of data collection, the questions outlined above needed to be answered. There are a number of possible methods which could be used to test the effectiveness of the exhibit, ranging from direct observation to various types of questionnaire. Whatever method is used to evaluate the success of the exhibit it needs to be able to collect information on the following aspects:- the beliefs of visitors regarding what they can do to help conserve plants; the attitudes of visitors towards conserving plants in their own gardens; and the conservation behaviour of visitors in their own gardens following their visit to Chelsea Physic Garden. A measure of increased awareness regarding conservation of plants after seeing the exhibit would indicate the information had at least been absorbed. The main method chosen was to use questionnaires, and the information collected by interviewing the visitors. This enabled structured standardized questions to be put to visitors before and after visiting the display and comparison to be made of the results to detect any differences in attitudes, beliefs and behaviour. A follow-up questionnaire was used to detect any changes in behaviour in visitors' own gardens after seeing the display.

The advantages of this type of data collection are that a richer set of data is collected compared to self-completed questionnaires, because respondents can be asked to

expand on and explain their responses. It also allows for ambiguous answers to be questioned. This method can also yield data on reception of information. If questionnaires are carried out before and after visiting the exhibit, responses can be compared to give information on visitors' increased awareness. Questions can be used within the questionnaires which give attitude information. The data from these questions can be compared from before and after visiting the exhibit, to give a measure of any changes in attitude. Information can be collected on behaviour by questions but only reported behaviour can be recorded, which may not always correspond to actual behaviour. Behaviour change itself can be found from a follow-up questionnaire after the visit. Questionnaires allow data to be collected on age, distance travelled, reason for visiting etc which are useful market research questions for the Garden. By using a structured questionnaire, the results can be statistically analysed and a reasonably large number of people can be questioned, increasing the reliability of the results. As the respondents were all asked exactly the same questions in the same order through a structured questionnaire, it is possible to be sure that all the answers relate to the exhibit in the same way, and are comparable. Therefore it is justifiable to combine the answers into statistical aggregates.

Other advantages which were observed during data collection included the fact that as it is a leisure setting, people were nearly always willing to talk. By using guided questions in a structured questionnaire it was possible to collect data on all the aspects of the exhibit and to measure the exhibit's success.

However, there were problems in collecting data of this sort in this type of venue. Visitors have paid to come in and want to enjoy themselves; the data collection taking place must not interfere with their enjoyment as they may not repeat their visit. The decision was made that it was not feasible to question visitors more than once, as this would become too much of an intrusion on their visit. People were questioned either before, or after visiting the exhibit on different days to ensure that the same person was not questioned twice. A comparison was then made between the two sets of questionnaires, rather than between individuals themselves, to see any differences in awareness or attitudes. Visitors who could not speak or read English were not covered by the questionnaire as it was only used in English. A possible

limitation in using this approach was the possible bias caused by interviewing different groups on different days. It was possible for the people interviewed after passing through the exhibition one day to have seen a programme on conservation the night before which changed their attitude and behaviour prior to viewing the exhibition. This source of bias could be detected in the follow-up questionnaire, by Question 12, which asked whether any other sources have influenced the respondents' gardening behaviour.

4.4.3 Self-completion questionnaires

Another type of data collection considered was self-completion questionnaires. This type of questionnaire could show awareness, attitudes and reported behaviour after a visit, from the written responses given. These responses could be compared with a group of visitors prior to visiting the exhibit and the differences noted. This method was considered but ultimately rejected in favour of questionnaires by interview because it was felt that greater success in completion of a large number of questionnaires would be achieved by this method as the questionnaire was reasonably long. Moreover, it was felt the questionnaire might not be completed without some encouragement. Also self-completion questionnaires need a suitable place to be distributed and collected. The entrance to the Garden would have been a suitable place for questionnaires before seeing the exhibit, but not suitable after visiting the exhibit. Another advantage of a self-completion questionnaire is that it does permit asking for a contact number for follow up. The drawbacks in using this method are that questions can be misunderstood and it is not possible to clarify the response given. Also the questionnaire can be answered by a group rather than just one person. However, an advantage in a self-completion questionnaire is that it is possible to get more honest and revealing answers as people are not inhibited by the presence of an interviewer, (S. Calver pers. comm.)

4.4.4 Interviews

An unstructured interview rather than a questionnaire could have been used to collect the information needed to evaluate the success of the exhibit. However, this method

would have demanded too much time from visitors and would have reduced the number of people it was possible to interview.

4.4.5 Direct observation

Another method of testing the success of the exhibit could have been direct observation. This would have answered the following questions: did people enter the exhibit; did people attend to the exhibit; but it would not show if the visit to the exhibit increased their awareness or changed their behaviour.

Ultimately, the most effective method to ascertain whether visitors to the exhibit altered their behaviour in their own gardens would be by observation of the actions they carried out in their gardens. This would give a direct measure which was instantly verifiable. The alternative of self-reported behaviour can lead to error, particularly in recalling past events. However, in this study there were not the resources available to observe every visitor willing to take part in a follow up study and self-reporting had to be used as an alternative. Observation of behaviour prior to visiting the exhibit was not possible as this would have led to visitors' awareness towards the behaviour change sought being heightened. Casual observation of people within the Garden and the exhibit did take place while the survey was taking place, although there were not the resources to carry this out in a structured format. Hence the decision was taken to rely on self-reported information.

4.4.6 Recording conversations

Recording what people do and talk about in the exhibit could give an indication of any increased awareness about plants or conservation but it does not record any subsequent behaviour changes. The work of McManus (1989) mentioned earlier (section 4.3.2) at the Natural History Museum, London has shown the usefulness of this method of recording by revealing that many more visitors are reading labels than it appears by visual observation of their behaviour.

4.4.7 Indirect observation

Indirect observation of the number of booklets '*Wake up to what you can do for the environment*' taken away, gives a measure of the interest shown in the exhibit, although this can only be a rough guide, as people may take a free leaflet simply because it is there to take but never bother to study its contents. However, this action does not give any indication of attitude or behaviour change. Other possible observations of behaviour include asking for a donation to be given and using this as a measure of response. At the Garden a measure of the types of plant sold at the plant sales area could have been a possible behaviour measure. For instance, if there was an increase in British native plant sales over non-native species this could indicate a behaviour change towards wildlife-friendly gardening, although there are many variables which could affect this type of behaviour, such as price.

4.4.8 Focus groups

A more time consuming method but one which collects in-depth data, is the use of focus groups. This method of data collection is useful if the understanding and views in depth on a subject are needed. The data gained is more qualitative than that from questionnaires as small groups of people are used. It is, however, difficult to get a sample, which is a representative view where small groups are used, as there could be considerable bias in the group. It would also be difficult to gain a measure of change in attitude or behaviour of an individual as a result of seeing the exhibit by using this method as the unit of analysis is the group, not the individual.

4.4.9 Conclusion on method

The method of data collection by questionnaire using interviews was chosen to be the most suitable for this research project. It enabled the beliefs of the respondents towards the behaviour of environmentally-friendly gardening to be investigated. It also allowed awareness and attitudes towards the environmentally-friendly behaviour to be recorded before and after visiting the exhibit, and a comparison to be made.

Behaviour change was determined from a follow-up questionnaire which respondents agreed to complete when they were interviewed in the Garden. Structured questionnaires enabled specific questions to be answered but also allowed more open responses to be recorded and explored. Quantitative data as well as qualitative data could be collected. None of the other possible methods would give this range of results.

4.5 Design of study

To assess the effectiveness of the exhibit in changing visitors' attitudes and behaviour towards conservation, and in particular visitors' behaviour in their own gardens, and also to assess increase in awareness towards plant conservation, visitors were asked to complete questionnaires. Three groups of questionnaires were used. These were used on 1) visitors who had just entered the Garden (69 respondents), 2) visitors who had been round the Garden but not through the exhibit (58 respondents), 3) visitors who had been through the exhibit (50 respondents). As a follow up, between one and six months later a further, different, questionnaire was used with visitors taken from the groups already interviewed, who had volunteered to answer a further questionnaire. These questionnaires assessed the long term effects of their visit including any reported changes in behaviour (66 respondents), (Appendix 5).

One of the paradigms used in research on attitude change involves three stages:- 1) Measure the subject's attitude toward the attitude object (pre-test), 2) expose the subject to a persuasive communication, 3) measure the subject's attitude again (post-test). If there is a change in the desired direction between pre-test and post-test measures, the persuasive communication is judged to have worked, (Gross, 1992: 520). The major drawback in this type of analysis is that the pre-test can influence the effect of the treatment and this is not isolated in the post-test measure.

> 'It has long been a truism in the social sciences that the process of measuring may change that which is being measured' (Campbell and Stanley, 1966).

4.5.1 Sources of bias

In this particular study it was felt that interviewing the same visitor both before and after they had visited the exhibit would produce a bias in the results which would be difficult to eliminate. Although it is possible to hide the research questions within other more general questions, the very act of interviewing would have heightened the awareness of the individual to certain subject areas and this would not have been possible to isolate in the analysis. To avoid this source of bias interviews were conducted of visitors to the Garden before or after they had visited the exhibit but different people were interviewed in each case. The respondents were all drawn from the same population or group, that of visitors to Chelsea Physic Garden. This ensured that the sample was representative of garden visitors, without having the bias of people being forewarned about the subject of the questionnaire before seeing the exhibit.

According to Campbell and Stanley (1966), two factors which need to be taken into account in deciding upon an experimental design are internal and external validity of the design. To establish the internal validity, one has to establish whether the questionnaire measures what it sets out to measure? In this case, did visiting the display make a difference to awareness, attitude and behaviour towards conservation in visitors' own gardens? To establish the external validity, the generalizability of the data needs to be established, in order to discover to what populations, settings, treatments, variables and measurement variables this effect from the experimental treatments, i.e. the visit to the display, can be generalized. For instance, would the same result be true of an exhibit in a library or shopping centre?

The results also have to be reliable, to the extent that repeat measurements made under constant conditions will give the same results. Ideally one would want to gauge reliability by repeating the questionnaire on the same people using the same methods. However this is difficult in practice because respondents would remember their first answers if asked to complete the questionnaire again. The two results would not be independent.

There are various factors which can influence the validity and introduce bias. Campbell and Stanley (1966) list 12 factors, of which the ones relevant to this study are discussed here. For instance, effects of history can introduce bias. Specific events can occur between the first and second measurement in addition to the experimental variable. In this case, as well as visiting the exhibit, people may be influenced by outside sources such as television programmes on conservation before completing the follow-up questionnaire. Other leaflets may be picked up in local libraries and garden centres outlining conservation issues which may influence attitudes and behaviour in the same way that the exhibit aims to influence them. To limit this source of bias a control group was used who had not seen the exhibit but who would be exposed to similar outside sources between the first interview and the follow-up. Different people were interviewed before and after seeing the exhibit. Thus history would not affect one group more than another because interviewing took place at random intervals.

Maturation can affect results, in that processes within the respondent can operate as a function of the passage of time. In comparing questionnaires from the group who have visited the exhibit with their follow-up questionnaires changes may have taken place in their attitude as a result of the passage of time rather than due to any factor of the experiment. Protection against this source of invalidity can be supplied by a control group who are also affected by maturation.

The testing itself can affect the results with a before-and-after design. It can heighten the awareness of the respondent to the issues being investigated. The questionnaire has to be structured in such a way that the early questions do not show the expectations of the researcher and thereby influence answers to the later questions. The follow-up group may have been affected by the testing from the earlier questionnaire they had answered.

Instrumentation can affect results by changes in the methods of collecting data. If there is a change in observer or scorer this can introduce bias. In this study a change of person carrying out the questionnaire could affect the results. Only two people carried out the interviewing and all the interviews were recorded on audio tape in

order that they could be checked for bias.

Statistical regression is a factor which needs to be taken into account in order not to introduce bias. Groups could be selected on the basis of their extreme scores and the changes in the post-test could be a result of this rather than any effect of the experiment. If, in the follow-up, questionnaires were only used on those people who were already positively disposed towards nature conservation, then the results could be due to this rather than the effect of the exhibit. Participation in follow-up was requested from both pre- and post- groups, and this source of bias was screened for in analysing the questionnaires by comparing the visitor profiles of the pre-, post- and follow-up groups.

Biases can be introduced resulting from differential selection of respondents for the comparison groups. The aim in forming the experimental and control groups should be to make them as comparable as possible. In that different people were being compared before and after viewing the exhibit, the groups they were drawn from should be the same in every respect except the experimental variable. To achieve this end all the respondents were from the group of Garden visitors and each interviewee was chosen randomly. Details were taken of age, gender, where people had travelled from and these were compared against visitors to the Garden as a whole to confirm that the respondents selected were representative of the general group of Garden visitors.

Furthermore, it is possible to lose subjects from the comparison groups during the course of the experiment. If, in our experiment, more of the anti-conservation respondents dropped out and were not followed up then the results would be affected by this rather than the effect of the exhibit. The follow-up questionnaires were checked against the original group of respondents to ascertain that they were representative of the original group and not a biased sample.

In order to carry out an experiment, it is often necessary to make special arrangements, and there is then the risk that these arrangements may interact with the experiment to produce an effect, whereas without these arrangements the experiment

would have no effect or an effect of a different magnitude. In this case there were no special arrangements.

4.5.2 Experimental Design

One of the most effective experimental designs used when the effect of a treatment, in this case a visit to an exhibit, is being investigated is the Solomon 4 group design (Campbell and Stanley, 1966). This design is considered effective because it allows for external validity factors to be considered. To use this type of design in order to collect relevant data, one group of visitors have to be questioned before and after visiting the exhibit. Another group of visitors have to be questioned before and after visiting the Garden, but not visiting the exhibit at all. Then a third group of visitors have to be questioned after visiting the exhibit but not before and a fourth group of visitors have to be questioned who had not seen the exhibit but had visited the Garden e.g. Table 4.1.

Table 4.1 Solomon 4 group design applied to this study

	Group	Before seeing exhibit	Exhibit	After seeing exhibit	Before seeing Garden	After seeing Garden
a.	Group 1	i	X	i		
b.	Group 2				i	i
c.	Group 3		X	i		
d.	Group 4					i

X shows the treatment i.e. visiting the exhibit.
i shows when interviewed

a. Shows the effect of the exhibit, by being able to compare responses in the questionnaires on beliefs and attitudes before and after seeing the exhibit. A comparison of a. and c. shows the effect of seeing the exhibit without any pre-test so the effect of a pre-test can be isolated. b. shows the effect of visiting the Garden without seeing the exhibit. If the Garden visit had any effect on attitude and behaviour then this could be isolated from the effect of the exhibit by comparing a. and b. Stage d. allows for any effect the questionnaire may have had in b. by testing visitors after they had seen the Garden but not before.

This type of design was not possible in this study because we did not wish to use a questionnaire with visitors more than once on a visit, so the above method was rejected in favour of a method which was less intrusive.

The design used for collecting data in our study conforms more closely to the post-test only control group design. In this experimental design the effect of the treatment, i.e. visiting the exhibit, can be isolated.

The experiment falls into two stages, Table 4.2.

Table 4.2 To show groups interviewed at Chelsea Physic Garden

	Group	Before seeing the exhibit	Exhibit	After seeing the exhibit	After seeing the Garden
a.	Group 1	i			
b.	Group 2				i
c.	Group 3		X	i	

X indicates the treatment i.e. seeing the exhibit, i indicates when interviewed

Group indicates the group of subjects answering the questionnaire

(i.e. three different groups all randomly drawn from garden visitors)

The design used for this study gives the same information as a 'post-test only' control group design i.e.

R X Group 1 post-test only control group design
R Group 2

i.e. two different groups, one receives treatment, one does not.

R indicates the subjects are drawn randomly, X indicates the treatment.

As questionnaires are used on people who have seen the exhibit and on those people who have not, the effect of the treatment i.e. visiting the exhibit can be isolated by comparing Group 1 with Group 3. In order to be able to compare the two groups and know that the differences found are not initial biases in the make up of Group 1 and Group 3, the groups have to be randomized. The effect of testing on groups Group 1 and Group 3 are the same, so any bias caused by testing the group treated is also found in the untreated Group 2. There is no effect from pre-testing as this does not

take place. The effect of the testing cannot be measured, but since the main question being investigated is whether or not the treatment (visiting the exhibit) had an effect, this extra information is not vital. It therefore controls for testing as the main effect and interaction.

The people questioned were all drawn from the same population of Garden visitors and in this way were part of the same group. This eliminates some effects of bias which might occur with different groups of people being questioned before and after seeing the exhibit, as differences might occur which were due to the differences in people rather than the effect of the exhibit. To make sure the two groups were similar, information was collected on age, frequency of visiting the Garden, reason for visit, and perceptions as to the role of Botanic Gardens. The separate groups Group 1 and Group 2 allow any influence of the Garden itself to be isolated. In practice these groups can be combined into a single 'not seen exhibit' group.

The experimental design used allows both the effect of visiting the exhibit and the effect of being in the Garden to be isolated. The effect of visiting the exhibit is isolated by comparing Group 3 with Group 1. The effect of being in the Garden is isolated by comparing Group 2 and Group 1.

Follow-up questionnaires were used for both the group who had been through the exhibit and those who had not. These were people who volunteered to be contacted at a later date to fill in a further questionnaire, Table 4.3.

Table 4.3 To show groups covered by follow-up questionnaires

	Group	Before seeing the exhibit	Exhibit	After seeing the exhibit	After seeing the Garden	Follow-up
a.	Group 1	i				i
b.	Group 2				i	i
c.	Group 3		X	i		i
d.	Group 1	i	X			i
e.	Group 2		X		i	i

a) Group 1 FQ At entrance to Garden, not seen exhibit, follow-up

b) Group 2 FQ In Garden, not seen exhibit, follow-up

c) Group 3 X FQ In Garden, seen exhibit, follow-up

d) Group 1 X FQ At entrance to Garden, seen exhibit (after initial questionnaire) follow-up

e) Group 2 X FQ In Garden, seen exhibit, (after initial questionnaire) follow-up

FQ is the follow-up questionnaire

X represents the treatment – that they had seen the exhibit.

Here again it was not possible to use the Solomon four-group design because it was not possible to use a follow-up questionnaire on people who had not answered one of the other questionnaires. To be able to follow-up visitors to the Garden, names and addresses were needed and there was no mechanism to be able to gain their names and addresses apart from through the use of questionnaires in the study. This design, however, did allow a comparison to be made between those respondents who had seen the exhibit and those who had not. By comparing the answers to the questionnaires in a. and b. with c., the long term effect of the exhibit in changing behaviour can be isolated in the follow-up questionnaires. If the initial questionnaire had any effect, for example, it might heighten the awareness of endangered plants and affect what visitors looked at in the exhibition, this might be isolated by comparing d. and e. with a. and b., as groups d. and e. visited the exhibit after they had been questioned. All respondents in these groups may have been affected by responding to the initial questionnaire.

4.6 Structure of the initial questionnaires

The questionnaires which took place in the Garden were all carried out by interview, with tape recordings being made of responses as well as noting them on the questionnaire. There is always a question of bias when conducting questionnaires by interview, indeed Brenner (1978) maintains that the numerous difficulties inherent in interviewing make claims for measurement untenable. For instance, the different social actions between interviewer and interviewee make comparisons between interviews subject to this bias. However, it was felt that the extra information gained on open questions outweighed the possibilities of bias, and the tight structure of the questionnaire helped to eliminate it. Two interviewers were used and the tapes of each interviewer were checked for bias, listening for leading questions, suggestive

responses and how questions from the respondent were handled. A selection of the tapes were listened to and the responses given checked against the written answers on the questionnaires. The subjects were chosen randomly. At the entrance to the Garden it was the first person passing a fixed point having entered the gate and paid their money at the kiosk. Subsequently it was the next person who passed the point, after the interviewer had finished the preceding interview. Outside the exhibit it was the first person who passed a point having exited the exhibit.

4.6.1 Questionnaire Design

The questionnaires were developed as the exhibition was being organised. A trial questionnaire was circulated amongst different groups of people, first of all by members of the Garden staff, to check that the questions they wanted to know the answers to were present. Next a student group of 15 people, including some for whom English was their second language, trialled the questionnaire as part of a research training session on questionnaire design. This allowed the form of the individual questions and their understandability to be tested. Finally a group of secondary school science teachers none of whom had visited the Garden tested the questions. From these responses it was possible to see that the questions could not be misinterpreted. The pre-test also looked at variation within responses to the questions, particularly the questions on attitude and awareness. The meaning of the questions was discussed, to ensure that the intended meaning of the question was shared with the respondents. The flow and order of the questions was checked to make sure that questions early on in the questionnaire did not indicate the manner in which later questions might be answered. The trial also allowed salient beliefs on what people felt they could do to preserve plants and the environment to be elicited. These were then used to guide the text of the persuasive communication in the display. It also enabled people's understanding of plant conservation to be determined.

The first 10 visitors interviewed with the final questionnaire were treated as trial and the structure of the questionnaire and variation in answers to the questions were checked before continuing. There was subsequently found to be no problem with

structure and these 10 questionnaires were included in the final analysis.

Questions 1-10 of the questionnaire (see Appendix 5 for a copy) collected information about the person being interviewed and served as useful market research data for the Garden. Question 11 probed the respondents' reasons for coming to the Garden - also useful for market research. Questions 12 and 13 elicited the respondents' understanding of what a botanic garden is and the reasons for the present day existence of botanic gardens. Questions 14 and 15 assessed the awareness of the respondent towards plant conservation. Question 16 gave a measure of the beliefs of the respondents towards actioning plant conservation.

Question17 looked at general environmental issues and which issues the respondent rated most highly, such as problems of pollution, overcrowding etc. Question18 consisted of a number of attitude and belief statements based on gardening practices conducive to the survival of wildlife. Each statement targeted a specific action, of the nine statements, five elicited attitudes towards various actions by asking whether the respondent agreed or disagreed with the statements on a five point scale:-

Strongly agree, Agree, No Opinion, Disagree, Strongly Disagree

e.g. I should use natural products as pesticides in my garden.

Four statements elicited behavioural beliefs by asking whether the respondent agreed or disagreed with the statements on a five point scale e.g. cutting down the amount of waste I produce will help conserve the environment. The use of a Likert-type scale allowed the strengths of the attitude toward the behaviour and the behavioural beliefs to be elicited.

Questions 14 to 18 could all be compared pre and post viewing the exhibit to give a measure of short term change in awareness and strengths of beliefs and attitudes. Questions 19 to 21 gathered information on the present gardening behaviour of the respondents. Questions 22 to 29 elicited more market research information on the respondent's experience of the Chelsea Physic Garden. In the post questionnaire

Question 26 gathered information on whether the respondent had visited the exhibit and Question 28 elicited whether the respondent would take part in a follow-up interview, with a space for name and address and contact number.

In the questionnaire used as visitors entered the garden Question 22 onwards questioned in further detail what visitors had come to see and Question 24 elicited whether the respondent would take part in a follow-up interview.

4.6.2 Questionnaire analysis

The open questions in the questionnaire were analysed using systemic networks (Bliss, Monk and Ogborn, 1983). These networks were used to capture the meaning of the different responses and to code them. This method was chosen because it allowed distinctions between responses to be drawn at different levels. This gives the possibility of analysing the answers at a fine level (the terminals) or at a grosser level under main headings, Fig 4.2. The codes for these responses and the responses to the closed questions were entered onto a spreadsheet using Minitab statistical software. This was then used to count the frequency of the different codes and to cross tabulate between questions.

The reliability of the coding was tested using a second coder for Question12, 13, 14 and 16 on 30 questionnaires. Each question was coded blind twice and the two codings compared with the original coding. This was done because it was felt that part of the initial lack of correspondence could be due to lack of familiarity with the coding scheme. For Question 13 the correspondence was 67% on the first coding, 75% on the second coding at the finest level of coding. At the second level of coding correspondence was 87% on the first coding, and 90% on the second coding. This was deemed to meet satisfactory levels of reliability.

Once all the responses of both open and closed questions on the pre, post and follow-up questionnaires had been entered on to a data sheet using Minitab statistical software, the results were analysed to discover any differences shown in beliefs, attitudes, intentions and behaviour towards wildlife and environmentally-friendly

gardening as a result of seeing the exhibition. Chapter 5 presents the results of the analysis.

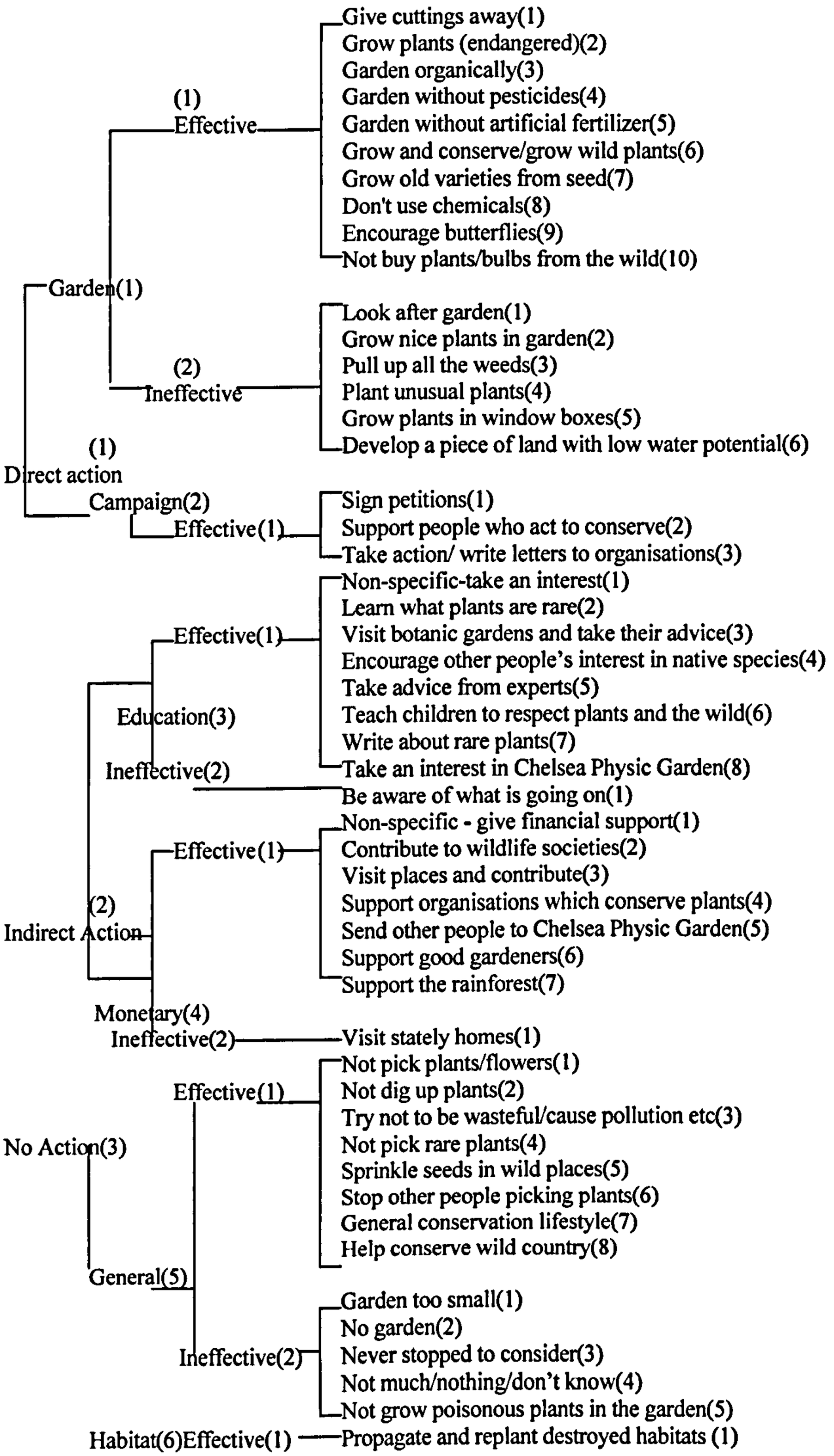


Figure 4.2 Coding network for Q16 What might you do to help conserve plants and the environment

Chapter 5 Results of the investigation into attitude and behaviour change at Chelsea Physic Garden

5.1 Introduction

The purpose of setting up the display in the conservatory and tearoom at Chelsea Physic Garden was to encourage visitors to change the way they gardened to a more environmentally friendly type of gardening. The text in the display followed the form of a persuasive communication; with information to induce people to behave in an environmentally favourable manner which would act upon their beliefs, in the hope that this would change their behaviour. The results of the questionnaires from visitors who were interviewed either pre- or post- display, and then from a group who were contacted between one and six months after their visit show the impact of the display on their attitudes and behaviour.

5.2 Results - visitor profile

The pre and post questionnaires included some general questions on characteristics of the visitors, such as age and gender, to enable the drawing up of a visitor profile (see Appendix 5 for copies of questionnaires). This also allowed a comparison to be made of the visitors' characteristics in the pre- and post- groups to ensure differences in results were not due to a different visitor profile in the two groups.

5.2.1 Gender

Of the 177 visitors who answered questionnaires in the Garden, 129 (73%) were female, and 46 (26%) were male. (Gender was not recorded on two forms (1%)). The pre- and post- groups had similar proportions of males and females in each group. Pre 26% males, 74% females, post 28% males, 72% females, (Table 5.1). Where

'Pre' means those people questioned before they had seen the exhibition on Endangered Island Plants and 'Post' means those people questioned after they had seen the exhibition. (The 'Pre' group includes those people questioned at the entrance to the Garden and in the garden; 'In' group).

Table 5.1 Number of males and females interviewed and questionnaire type.

Questionnaire Type	Male (n=46) No (%)	Female (n=129) No (%)	Total
Pre & In	32 (26%)	83 (74%)	125
Post	14 (28%)	36 (72%)	50
Total	46	129	175

5.2.2 Age

The interviews covered a range of ages from 21 years old to over 60 years old. The pre- and post- groups of interviews had a similar range of ages with similar proportions in each group shown from information collected in the questionnaire, (Table 5.2).

Table 5.2 Numbers and percentages of visitors in each age group compared to questionnaire type.

	Age of respondent					
Questionnaire type	21-30yrs	31-40yrs	41-50yrs	51-60yrs	60+yrs	Totals
Pre	21 (18%)	23 (20%)	24 (20%)	23 (20%)	26 (22%)	117
Post	14 (30%)	10 (21%)	9 (19%)	4 (9%)	10 (21%)	47
Totals	35	33	33	27	36	164

The age of the respondent was not recorded on 13 forms. There are some differences in the age groups between pre- and post-groups, in the post-group a higher proportion of people interviewed were in the 21-30 years age group and a lower proportion in the 51-60 years age group. A chi-squared test to test whether there was

a significant difference between the numbers of people of different age category shows the differences not to be significant, ($X^2 = 4.8$ with 4 degrees of freedom. To be significant X^2 needs to be equal or greater than 9.49).

5.2.3 Frequency of visit to the Garden

For the majority of visitors 138 (78%) it was their first visit to the Garden. The number of previous visits to the garden was the same for both the pre and post groups, (Table 5.3).

Table 5.3 Table to show the frequency of visits to the Garden compared to questionnaire type.

	Number of times visited			
Questionnaire type	No previous visits	Visited once before	Visited twice before	Visited more than twice before
Pre	78%	6%	2%	14%
Post	78%	6%	2%	14%

5.2.4 Type of group

Approximately half the visitors questioned had come on their own to the Garden, 67 (53%) in the pre-group, 21 (42%) in the post-group. Some had come with their families 32 (25%) of the pre-group, 19 (28%) of the post-group. 22 (17%) of the pre-group were visiting friends and eight (16%) of the post-group, and six (5%) of the pre-group, two (4%) of the post-group interviewed were part of an organised group.

5.2.5 Visits to other gardens

The majority of visitors questioned had visited other gardens open to the public including a higher proportion of the post-group, 82 (65%) of the pre-group and 40 (80%) of the post-group. More of the pre-group grew plants in a garden, 106 (83%) of the pre-group and 31 (62%) of the post-group and a higher proportion of the pre-

group grew native plants, 94 (73%) of the pre-group compared to 30 (60%) of the post-group.

5.2.6 Reason for visiting Chelsea Physic Garden

Visitors were asked to choose from a prescribed list of interests their main reason for visiting the Garden (Table 5.4). The majority 86 (49%) chose an interest in gardening as their main reason for visiting. 63 (50%) of the pre-group chose gardening as their main reason and 23 (46%) of the post-group chose gardening as their main reason. Other reasons which were chosen included for pleasure 70 (39%) of all respondents, a medical interest was chosen by 36 (20%) of people, a historical interest was chosen by 45 (25%) of people, an interest in herbs was chosen by 39 (22%) and other interests were chosen by 33 (19%) of respondents. It was possible to choose more than one main reason for visiting. These are interesting results when compared to other gardens. In a recent study, 'Learning in Gardens', conducted by the National Trust in 2003 of four gardens (Stourhead, Clumber Park, The Courts and Plas Newydd), the research found that, for the majority of visitors, the most important aspects of a visit to a garden were the aesthetic appeal, peace and quiet, labelling of plant names, and information on the history and design of the garden. The availability of a gift shop or tea-room was also important, (Calver, Bournemouth Market Research, 2003). This suggests that visits to Chelsea Physic Garden are more purposeful as the most popular reason given was an interest in gardening, rather than for pleasure. As the garden is only open two afternoons a week (Wednesday and Sunday) the visits may be more planned than a casual visit.

Table 5.4 Reasons for visiting the Garden

Reason for visiting the Garden	Pre (n=127)	Post (n=50)	All (n=177)*
Gardening	63	23	86
Pleasure	52	18	70
Historical	32	13	45
Herbs	29	10	39
Medical	21	15	36
Botany	22	10	32
Other	15	18	33

* multiple responses were possible

5.2.7 Summary of visitor profile

The visitors within the two groups: 'pre' before seeing the exhibition in the conservatory, and 'post' after seeing the exhibition in the conservatory were of broadly similar profiles when compared by gender, age, frequency of visits and reasons for visiting. There were more females than males visiting the Garden as a whole but the ages were evenly spread between the age categories, from 21 to 60+ years. For the majority of visitors it was their first visit to the Garden. Visitors to Chelsea Physic Garden were interested in gardening and visiting gardens, this indicates that they may well be receptive to conservation information about how to garden in their own gardens, because as a target audience they came to find out about plants, and in some cases specialist subjects on plants such as herbs and medicinal plants. If they were receptive to information on plants, and the messages on conserving plants can be linked to the information on plants, then it is likely they will take an interest in the conservation information as well.

5.3 Awareness - short term

The purpose of the initial questionnaire, before and after visiting the exhibit, was to

ascertain the effect of visiting the exhibit on attitudes and behaviour towards nature conservation and in particular environmentally-friendly behaviour in their own gardens. Questions were included in the questionnaire to measure changes in visitors' awareness to find out if the exhibit had been attended to and which beliefs influenced.

To assess awareness and beliefs about plant conservation, visitors were asked in the questionnaire, '*What are the reasons which might be given for conserving plant species?'* and '*Can you name any particular plant species needing protecting or conserving?' 'If so please name two'. 'Why do those plant species need protection?'* Questionnaires were answered by visitors before they had seen the exhibit and by a different group of visitors after they had been through the exhibit. This allowed a comparison to be made of the effect of the visit on awareness and beliefs. The specific parts of the exhibit which were relevant to the awareness questions included the following: - in the glasshouse there was a display of endangered plants where the label on each plant outlined the specific threat to it; in the main room photographs of the endangered island plants had captions with information on the reason why they were in danger. Also the text which accompanied the photographs had a section 'why do plants need to be conserved' which outlined; the usefulness of plants in every field of life; how humans and animals depend on plants; and the use of plants in medicines, (see Appendix 2).

For the question, '*What are the reasons which might be given for conserving plant species?*' the reasons the respondents gave were grouped under broad descriptive headings.

Functional comments included comments such as the need to preserve plants because they provide food, medicines etc. *Ethical comments* included 'the right of plants to be on the earth' and 'not killing things we cannot replace'. The *potential future use* of plants included the conservation of the gene pool and the loss of knowledge. *Intellectual interest* included comments on learning about climatic

change and the historic interest of plants. The *preservation* category was used for the response that was given of conserving plants 'to preserve them', for the future so they do not die out. The other category was used for miscellaneous responses that did not fit into any of the other categories, including 'plenty of reasons', and 'don't know'. Some respondents likened conservation of plants to conservation of animals.

Table 5.5 Categories of response to the question, "What are the reasons which might be given for conserving plant species?"

Type of comment	Pre (n=69) No %	Post (n=50) No %
Functional comments	47 (68%)	43 (86%)
Ethical comments	5 (7%)	14 (28%)
Potential future use	22 (32%)	13 (26%)
Intellectual	7 (10%)	4 (8%)
Preservation	19 (27%)	6 (12%)
Other	9 (13%)	7 (14%)

(The 'in' group were not included in this table to give a direct comparison pre and post without the influence of the garden. Multiple responses were possible)

The different descriptive comments varied significantly between the pre- and post-groups, with more functional and ethical comments from the groups who had seen the exhibit. Other response categories where differences between pre- and post-groups were found included less potential future use, intellectual and preservation comments. If the responses in the different groups, pre- and post- the exhibit, are compared as a whole, then there is a significant difference between the pre- and post-groups. (Chi-squared =12.2 with 5 d.f., $p<.05$).

This increase in functional and ethical comments from those visitors who had seen the display can be explained by the display having an effect on visitors' awareness and beliefs of conservation issues. As the display had a major section on the importance of plants, in particular describing their uses, the display also carried the phrase: 'We have a responsibility to future generations to conserve the biodiversity of our planet,' giving an ethical reason for conserving plants. This message may

indeed have influenced the response of the visitors who had seen the display.

However, more than half the people interviewed in each group could not name a plant needing protecting or conserving although the display in the greenhouse was primarily of endangered plants.

	pre	post
Not able to name a plant needing conserving	41 (59%)	29 (58%)

It is possible that visitors were not interested in the names of plants, or alternatively, names are not something people can internalize and remember from a display but they do remember key messages.

Of those respondents who *did* name a plant needing conserving 20 of the 50 comments (40% of the total comments pre and post, 14 pre-comments and 6 post-comments) gave habitat destruction as the reason why the particular plant named needed conserving, an activity illustrated in the display (see Appendix 6). Other reasons given included competition, over-collection and pollution.

5.3.1 Awareness of botanic gardens

Two of the questions on the questionnaire related to the public's perceptions of botanic gardens. The questions were designed to discover whether visitors considered botanic gardens were any different from any other gardens they visited and also to see if they particularly saw an educational or conservation role for botanic gardens. The open comments were coded using a systemic network with the first major division being either functional comments or descriptive comments. The functional comments related to the functions a botanic garden might perform such as research, education and conservation. The descriptive comments related to the way a garden might look including the types of plants grown and the layout. An 'other' category was used for comments which were not functional or descriptive such as 'pay to get in' or 'don't know'.

Table 5.6 Respondents reasons for botanic gardens

	Pre (n=69) No (%)	Post (n=50) No (%)
Education	38 (55%)	29 (58%)
Conservation	31 (45%)	24 (48%)
Research	26 (38%)	20 (40%)
Amenity/pleasure	13 (19%)	5 (10%)
Study	11 (16%)	3 (6%)
Historical	7 (10%)	3 (6%)
Horticulture	7 (10%)	4 (8%)
Other	5 (7%)	1 (2%)

The results show that more than half the respondents state that the reason for having botanic gardens is for 'education' and just less than half the respondents that 'conservation' is a reason for having botanic gardens with 'research' as a reason being the third most popular category. The 'amenity' function is fourth most popular in the list. In the post-group comments, there is a slight increase, which is not significant, in the comments related to education, conservation and research and a decrease in the pleasure/amenity and study related comments. This could indicate that the display has given respondents a better understanding of the role of botanic gardens through highlighting the importance of plants rather than through having any explicit material about botanic gardens' role.

'*What makes a Botanic Garden different from other gardens?*' was also an open question with responses being analysed using a systemic network then combined into broad categories, (Table 5.7).

Table 5.7 Responses to the question:-'What makes a Botanic Garden different from other gardens?'

	Pre (n=69*) No (%)	Post (n=50*) No (%)
Functional responses		
Research	8 (12%)	10 (20%)
Education	9 (13%)	7 (14%)
Study	5 (7%)	6 (12%)
Historical	5 (7%)	4 (8%)
Amenity	0	0
Horticulture	1 (2%)	1 (2%)
Conservation	2 (3%)	0
Other	2 (3%)	2 (4%)
Descriptive responses		
Types of plant grown	37 (54%)	37 (74%)
Ways of displaying plants	36 (52%)	14 (28%)
other	3 (4%)	1 (2%)

*multiple responses were possible

The majority of the responses to this question were descriptive; either describing the types or variety of plants grown or the way they were grown i.e. that the plants were labelled or the beds were laid out scientifically. A smaller percentage of the comments were functional comments. The comment that botanic gardens undertook research, unlike other gardens, increased slightly in the post-group after seeing the display, possibly due to the display itself being present. It is probable that in comparing botanic gardens to other gardens the respondents had visited, the differences in display and layout were much more apparent than some of the behind the scenes activities such as research, which are quite well hidden inside buildings with no public access. However, respondents gave education, conservation and research as the most popular *reasons* for having botanic gardens, which would imply that they would be receptive to an exhibition with an educational purpose such as the display on endangered island plants.

5.3.2 Awareness – long-term

By looking at what visitors remember from their visit the long-term impact of the exhibit can be assessed. Specific questions in the follow-up questionnaire on attitude

and behaviour show the impact of the exhibit on changing beliefs, attitudes and behaviour towards conservation in their gardens. The questions on awareness give a measure of the overall impact of the exhibit.

67 of the respondents interviewed in the Garden completed follow-up questionnaires between one and six months after their visit. The questionnaire was in two parts; the first part asked about memories of the visit, recall of the display and changes they have made in their own gardens as a result of seeing the display; the second part asked about gardening practices in their own garden (Appendix 5). This second section was included to give a measure of the respondents' actual behaviour in their own garden. Questions in the follow-up questionnaire investigating awareness of the display included:

'What reasons can you recall for plants in the display being under threat?' and *'What, if anything, can you recall about suggestions made in the display about the way the public could enhance conservation in their own gardens?'*

46 of the respondents returning the follow-up questionnaire remembered visiting the display and 21 did not. Of those 46 visitors to the display, 33 (72%) gave reasons for plants being under threat. 29 (63%) recalled one or more of the plants in the display from the list given and 19 (41%) recalled one or more of the islands the plants in the display came from. 18 respondents (39%) gave suggestions they could recall to enhance conservation in their own gardens. The majority of these suggestions included information about growing native plants, (Table 5.8).

Table 5.8 Categories of response to the question concerning display information on conservation in the garden

Responses on conservation	No (%) (n=18*)
Grow native plants/allow wild areas	7 (39%)
Reduce use of chemicals	5 (28%)
Don't use peat	3 (17%)
Grow plants which encourage insects	3 (17%)
Plant rare plants	3 (17%)
Don't buy bulbs dug up from the wild	2 (11%)
Make compost	2 (11%)

* multiple responses were given

Although the number of respondents is small (18), this response shows that more than a third of respondents who remembered visiting the display (46) could accurately recall suggestions for enhancing conservation in their own gardens; shown by their response to the open question directly matching information given in the display. This shows the display has had some impact on awareness, which has survived a number of months. Both the question on conservation and the one on which islands the plants in the display came from were open questions with a similar number of respondents (18 and 19 respectively). Whereas the recall question on plants within the display was presented as a list, and had more respondents (29) as a result. Therefore, without prompting, more than a third of those seeing the exhibit that were followed up (39%) could recall accurately suggestions to enhance conservation in their own gardens a number of months after seeing the display, which shows considerable impact from the exhibit.

Little research has been carried out on long term impacts of exhibitions. Stevenson (1991) reports that in a follow-up interview (FUI) 6 months after visiting the Science Museum Launch Pad:-

> 'Most of the recalled memories were episodic in nature although the FUI also contained material that was not episodic, indicating that memories of the visit had been processed subsequently.' (Stevenson, 1991: 530)

Here, at Chelsea Physic Garden a proportion of visitors have accurately recalled information given in the display a number of months later and are showing evidence of semantic memories i.e. they have processed information and remembered facts. In contrast a study by McManus (1993) of visitors to Gallery 33 in the Birmingham Museum showed of 28 replies received from a mail out to 136 people who had visited the gallery, 138 separate individual memories were separated out and placed into 5 categories:- none of the reported memories related to the content of the exhibit.

1. Objects of things - 51% (n=70)
2. Episodic events - 23% (n=31)
3. Feelings at the time of the visit - 15% (n=21)
4. 'Summary memories' on recall - 10% (n=14)
5. Content (Science) of exhibit – 0

Therefore, the information presented in the exhibit at Chelsea Physic Garden on ways to enhance conservation in one's own garden must have had an impact in order to prompt the amount of recall we see here (more than a third of respondents accurately recalled suggestions), in contrast to other exhibitions where little recall long term is common (McManus, 1993).

Respondents were also asked about their memories of their visit to the Garden through the initial question on the follow-up questionnaire.

'Thinking back to your visit when I spoke to you at Chelsea Physic Garden, what two things do you remember best about your visit?'

This was then followed up by three additional questions

'What, if anything, do you remember about the layout or structure of the Garden?'

'What, if anything, do you remember about the information given in the Garden?'

`What, if anything, do you remember about any horticultural advice given in the Garden?'

Table 5.9 Categories of response to the question 'what two things do you remember best about your visit?'

	n=67
Plants -general	42
Atmosphere	19
Plants -names	16
People	7
Labels and information	6
Layout	6
Weather	5
Tea	3
Enjoyment	3
Other	3
Exhibitions	2
Guided tours	1
No response	1
Total responses	114

(N.B. multiple responses were possible)

Overall the key aspects of the visit which people remembered best were the plants and the atmosphere of the Garden. In that a visit to a botanic garden is primarily to see the plants it is not unexpected that plants should figure highly in memorability; however the high score of the atmosphere as a key feature indicates that this is a significant feature in this Garden. For the questions asking about memories of the visit to the garden, unprompted mentions of the exhibit or information in the exhibit,

such as 'grow native plants', occurred 17 times. These data consisted of responses twice in the question about the two things remembered best, eight times in the question about horticultural advice, and seven times in the question about information showing good recall of many aspects of the exhibit.

Memories tend to be made up of episodic or semantic references. Episodic memories consist of autobiographical information about events in one's life, whereas semantic memories result from cognitive processing and consist of facts about the world in general. On the whole the initial responses to the question on memorability give answers which indicated episodic memories. This would be expected from a leisure visit to a Garden. However, later in the questionnaire when questions were asked about the exhibit, semantic memories were also revealed, shown by the responses in Table 5.8. In contrast to McManus' study (1993) respondents here have recalled the display and information contained within it both in their episodic memories and their semantic memories. There is also some indication that respondents have recalled information sometime later which they did not recall when questioned immediately after seeing the display (i.e. on the day of their visit). This shows the usefulness and value of following up visitors to get a truer picture of the impact of a visit on their awareness.

5.4 Beliefs

According to the theory of Ajzen and Fishbein (1980), in order to change behaviour the beliefs underlying the attitudes towards the behaviour need to be influenced. To guide the writing of the exhibit text, the salient beliefs about nature conservation and gardens of people in general were determined from the literature, and the salient beliefs about wildlife gardening of a specific group of teachers were determined using a trial questionnaire. This information guided the writing of the text.

Beliefs of visitors towards their own actions in the garden and the influence of the exhibit on these beliefs were ascertained by the question in the initial questionnaire:-

Q16 *What might you be able to do to help conserve plants and the environment?*

The responses given to this question were analysed using a systemic network, then grouped into broader categories. These broader groups were responses concerning gardening; campaigning; education; money; and a category for general action in the environment such as not picking plants. Each of these groups was then categorized as to whether the action would be effective in conservation or whether it would be ineffective. An effective gardening action would be one such as 'giving cuttings away' and 'encouraging butterflies', an ineffective gardening action would be 'pulling up all the weeds' or 'growing nice plants' as it is not possible to justify how these will aid in conservation see Fig 4.2 for systemic network.

Table 5.10 Categories of response to the question 'What might you be able to do to help conserve plants and the environment?'

	Pre (n=69*)	Post (n=49)
Gardening Effective	26 (38%)	24 (49%)
Ineffective	9 (13%)	4 (8%)
Campaigning Effective	3 (4%)	3 (6%)
Educating Effective	12 (17%)	7 (14%)
Ineffective	2 (2%)	1 (2%)
Donating money Effective	23 (33%)	12 (24%)
Ineffective	1 (1%)	0 (0%)
General environmental action Effective	14 (20%)	18 (37%)
Ineffective	9 (13%)	6 (12%)

(*Multiple responses were possible)

From looking at the table it is clear that the categories of effective general environmental action and effective gardening show an increase in the percentage of

responses from the group who had seen the exhibit, and the categories of effective action donating money and educating show a decrease in the percentage of responses from the group who had seen the exhibit. Thus it would seem possible that the display has had the effect of focusing the beliefs of visitors towards direct environmental action, that is, action which has a direct effect on the conservation of plants, including the way they behave in their own gardens - and away from indirect action such as educating people and donating money, both of which were not mentioned in the display.

This slight shift towards effective gardening could show that the messages contained in the display have been taken in by visitors and focused their thinking. It may also be that bringing the conservation of plants; the threats which are endangering plants; and the importance of plants to the attention of the public has highlighted their awareness of the immediacy of the problem and shifted their thinking towards direct action. The aim in targeting beliefs with information in the exhibit on 'what you can do to help conserve plants' and 'what you can do in your own garden' was to influence beliefs about behaviour towards conservation in their own gardens. After seeing the exhibit, respondents believed more in direct effective action for conservation including gardening in their own gardens (49% effective gardening actions post-display, compared to 38% effective gardening actions pre-display), so the beliefs have shifted slightly towards effective actions but not significantly. (A comparison of each of the categories: gardening; educating; donating money; and general environmental action; by turn in a two by two contingency table, comparing pre- and post- responses against 'effective or ineffective', does not give a significant difference at the 5% level, nor does comparing effective direct action such as gardening and campaigning against effective indirect action such as donating money and educating, so the display is not showing a significant effect.)

General environmental beliefs were also investigated using the question -

Q17 '*Which of the following do you believe are the three most important issues facing us in the world today?*'

Visitors found this question hard to answer. They felt that all the issues were important and that the question was a deep and serious one. Responses seemed to be partly influenced by crises which were taking place in the world at the time of the questionnaire (see questionnaire Appendix 5 for available responses). In particular the riots in Los Angeles prompted comments on breakdown in law and order, and the famine in Somalia prompted comments about over-population.

Of the eleven categories given including 'other'
the most important was felt to be over population;
the second most important was felt to be pollution;
and the third most important was world hunger.

There was a slight variation in responses between the groups.

Table 5.11 To show most popular responses between the three groups to the question 'Which do you believe are the three most important issues facing us in the world today?'

	Most important		Second most important		Third most important	
Category Group	Overpop-ulation	poverty	pollution	Environ-mental destruction	world hunger	Environ-mental destruc-tion
Pre	29 (42%)	23 (33%)	20 (30%)	18 (27%)	24 (38%)	24 (38%)
In	20 (36%)	19 (34%)	14 (25%)	10 (18%)	16 (32%)	14 (28%)
Post	20 (40%)	7 (14%)	9 (18%)	14 (28%)	14 (31%)	13 (29%)
Totals	69	49	43	42	54	51

The only category in these responses which appeared in the display was environmental destruction. This category was placed above pollution as the second most important issue in the group who had seen the exhibit. The display seems to have had little effect on general environmental issues and was not aiming to have an effect on general issues. Hence, this result is not unexpected, and is consistent with

the position taken by Ajzen and Fishbein that it is important to influence the specific attitude toward the behaviour rather than general environmental attitudes.

5.5 Beliefs and Attitudes

A Likert-type scale was used to detect strengths of attitudes and beliefs towards eleven different environmental activities. The use of a scaling method allowed information to be collected on whether the respondent was favourably inclined towards an activity and also to get a measure of his or her actual position on the attitude continuum. The scale was a five point scale from agree strongly, agree, no opinion, disagree, disagree strongly.

Of the belief statements, two were directly related to information in the exhibit and three were general environmental belief statements. The two specific statements were:

> '*If I buy artificially propagated bulbs it will help conserve the numbers growing in the wild*'
>
> '*If I grow native plant species in my garden it will help conserve wildlife*'

For both the statements both groups had the majority of respondents agree or agree strongly with the statements.

> Statement 1- '*If I buy artificially propagated bulbs it will help conserve the numbers growing in the wild.*'
>
> Pre 60.5%
>
> Post 54%

There was a slight rise in the no opinion category for the post-group, from 19% to 24% possibly due to the respondents who did not have gardens. The wording in the exhibition on this issue was slightly different from the question and it may have

confused respondents. The exhibit suggested that people should not buy bulbs dug up from the wild. It may be that respondents did not link artificially propagated bulbs as a substitute to depleting wild populations by buying wild collected bulbs. Hence the lack of increase in the post-group.

For the second statement the majority of the respondents agreed or agreed strongly with the statement:

77% Pre 66% Post	*'If I grow native plant species in my garden it will help conserve wildlife.'*

Although the slight drop in the post-group is counter to what is expected, it may be that the already strong positive attitude gave little room for change. Or it may be that people did not make the link between native species and conservation. Also more people in the pre-group had gardens and already grew native plants so the difference could be accounted for by those people without gardens (mostly in the post-group) not agreeing with the statement as they did not have gardens.

The results obtained for the general environmental belief statements were already strongly positive hence there was no change between pre- and post-groups.

93% Pre 94% Post	*'Cutting down the amount of waste I produce will help conserve the environment.'*

Less respondents agreed that their actions were responsible for the destruction of rain forest but it was still more than half.

61% Pre 56% Post	*'My own personal actions accelerate the rate of rain forest destruction.'*

5.6 Attitudes

One way of determining the attitude of respondents is to rate the attitude towards the performance of the behaviour on a differential scale. Two statements on attitudes were specifically linked to attitudes towards behaviour in respondents own gardens and to text in the exhibit.

1. *'I should use natural products as pesticides in my garden'*
2. *'I should be able to buy peat for use in my garden'*

Results on statement 1, on natural products, showed 87% of visitors questioned before seeing the exhibit and 90% of visitors after seeing the exhibit agreed with the statement. Results on statement 2, on peat, showed 59% disagreed or disagreed strongly with the statement before seeing the exhibit, 56% disagreed or disagreed strongly after seeing the exhibit.

These attitude statements showed similarly high levels of positive attitudes. This generally high positive attitude gave little room for change from any influence of the exhibit.

5.7 Behaviour

The aim in designing the exhibit was to influence visitors' behaviour towards environmentally-friendly behaviour in their own gardens. Visitors were asked in the initial questionnaires about their gardening behaviour to gain an indication of areas where behaviour change might occur. Results from the initial questionnaires showed a strong interest in gardening, as might be expected from visitors to a botanic garden.

5.7.1 Interest in gardening

Of the pre-group 106 (84%) grew garden plants compared to the post-group where 31 (62%) grew garden plants.

For the pre-group 94 (75%) grew native plants, 68 (55%) maintained part of the garden particularly for wildlife.

In the post-group 30 (61%) grew native plants and 15 (30%) maintained part of the

garden particularly for wildlife.

64% of all visitors interviewed had compost heaps. 69% in the pre-group and 52% of the post-group had compost heaps.

These figures for compost heaps are almost certainly higher than would be found in the British population as a whole. For example in the government publication '*Wake up to what you can do for the environment'* (1990), the figure given for people in Britain recycling household waste is 25%.

5.8 Behaviour change

The ultimate aim of the exhibit at Chelsea Physic Garden was to influence the way people behaved in their own gardens. To get a measure of any behaviour change visitors were asked if they would be prepared to take place in a further questionnaire when they responded to the initial questionnaire. 119 visitors were sent questionnaires between one and six months after their original visit. Of these 67 returned the follow-up questionnaire (56%). Of the 67, 46 had seen the exhibit (15 of these were from the pre-group who had gone on to see the exhibit after responding to the questionnaire).

Of the 46 people who visited the display 14 (30%) mentioned the display or information given in it, unprompted, in the responses to initial questions on memories of their visit. These remarks varied from 'I felt encouragement to grow native species' to 'some horticultural advice given on way to café'. When asked specifically about the exhibit and what they could recall from it 78% recalled information from the exhibit. Of those people who visited the exhibit 11 people i.e. 24% reported that they had made changes in the way that they gardened or intended to make changes. A further 5 (11%) took the booklet but did not remember seeing the display and made changes as a result of the booklet. Four people reported that they were doing all they could anyway. The combination of the booklet offered in

the conservatory and the information in the display influenced the conservation minded behaviour of 16 out of the 46 people who took the booklet or visited the display i.e. 35%. If the results of those who changed their behaviour are compared with those visiting the display and those not visiting, then there is a significant difference between the groups (Table 5.12). 35% of those respondents who visited the display changed their behaviour compared to 9% of respondents who changed their behaviour and had not visited the display.

Table 5.12 To compare the difference in behaviour change between those who saw the display and those who did not see the display

	Changed behaviour	No behaviour change	Total
Visited display or looked at book	16	30	46
Did not visit display or look at book	2	19	21
Total	18	49	

Chi squared = 4.68 with 1 d.f. , $p < 0.05$.

Of all the respondents who completed follow-up questionnaires 50 out of the 67 i.e. 75% said that other sources such as reading or television had made an impression on the way they behaved towards the environment and wildlife in their home and garden.

Given that these visitors were already showing a positive attitude toward various aspects of gardening friendly behaviour, as can be seen from the initial questionnaires (75% of the pre group grew native plants and 55% maintained part of their garden for wildlife), the fact that approximately one third of the visitors reported some behaviour change or intended behaviour change shows a positive impact from visiting the exhibit. In contrast, of those 21 respondents who were followed up and had not seen the display, only two mentioned changes they would like to make which were; 'bringing in more varieties of native species', and 'keeping native species and putting in a wildlife pond'. Of those respondents who had read the book but not seen the display there were four comments; one respondent would like

to control mildew on roses without spraying, one plant more wild plants, one make a pond, one try to garden more ecologically and not use pesticides. The results of this study show that a persuasive communication *can* influence behaviour, and using a persuasive communication as part of an exhibit is a useful way of influencing visitor's behaviour.

5.9 Summary

Immediately after seeing the exhibit visitors were more aware of the need and reasons to conserve plants. This awareness continued and long term awareness was shown by visitors, in particular they were more aware of how to enhance conservation in their own gardens.

Before seeing the display, visitors' beliefs about what they could do to conserve plants and the environment focussed on donating money and effective gardening activities. After seeing the display, a greater proportion of visitors were able to suggest effective gardening activities and direct environmental action became more prominent in the answers. Questions directed at attitude, asking respondents to rate performance on a differential scale, showed them to be strongly positive towards environmentally-friendly behaviour in their own gardens both before and after seeing the exhibit.

The key to the exhibit - whether it did indeed influence behaviour - or whether in fact the changes shown could have happened by chance is shown by the results in the follow-up questionnaire. A third of the visitors who sent back the follow-up questionnaire were influenced either by the exhibit or the booklet to make changes in the way they gardened to environmentally-friendly gardening. Showing the influence of the exhibit persisted for some time after the visit. From looking at the results as a whole the exhibit can be seen to have a significant and lasting impact on those visitors who took part in the survey.

The exhibit was only one part of the many influences on visitors' attitude and behaviour towards gardening in a conservation-friendly way. When asked about other sources, respondents spoke or wrote about significant television programmes or books and magazines they had read. Many of the visitors may already have been aware of the importance of their garden for conservation from other sources, so may not have been in a position to change an already positive behaviour.

Of the visitors to Chelsea Physic Garden who took part in the survey, the majority showed positive environmental attitudes. The problem in influencing these people was not one so much of altering attitudes and behaviour but of focussing it to be effective. The persuasive communication was able to provide this targeted focus.

5.10 Discussion

This research study shows strong evidence that the visitors to Chelsea Physic Garden who visited the exhibit on endangered plants attended to the messages. This was apparent from answers to the question on 'the reasons why plants should be conserved'. The percentage of ethical comments increased in those visitors who had seen the exhibit, indicating an increase in concern and an increase in awareness, short-term visitors showed more concern for the importance of plants.

Moreover long-term, visitors remembered ways in which they could enhance conservation in their own gardens and particularly the use of growing native plants and allowing 'wild' areas. A third of visitors to the exhibit who responded to the questionnaire either changed the way they gardened or intended to make changes as a result of seeing the exhibit. The results of this research clearly demonstrate that it is possible to influence attitudes and behaviour of visitors towards nature conservation by using an exhibit in a situation such as a botanic garden.

In order to influence behaviour it is necessary to influence the beliefs about the behaviour. The exhibit aimed to do this through the persuasive communication used.

The effect of the display on the answers to a question directed at beliefs 'What might you be able to do to help conserve plants and the environment?' showed more people suggested effective action, either in gardens or in general, after seeing the display than before. The research has shown that the persuasive communication in the exhibit was able to act on beliefs to change them. This is an important finding as it shows that beliefs can be influenced by education through a persuasive communication. The wider implications of this finding are that museums and displays could be much more influential in changing visitors' behaviour.

The content of the text and the way it is written is crucial as it must form a persuasive communication. This contains the elements of information and some form of inducement or persuasion, linking the behaviour to various positive or negative outcomes, and targeting the beliefs about the behaviour. It is unlikely that information on its own would have enough effect to influence behaviour change. Although this was not tested in this research study it has been shown by other studies. For example, Ajzen and Fishbein (1980) argue the importance of the content of the message, and test the effects of differently structured messages on changing the behaviour of alcoholics.

Many examples of research aiming to change behaviour have been reviewed, but few have been found to look for a model to use in successfully carrying out a behaviour change. It is the implementation of a clearly structured method or model of behaviour change which has enabled success in the study at Chelsea Physic Garden. The Ajzen and Fishbein model of behaviour change has proved to be a model which can be implemented and show results in changing behaviour.

The approach adopted in this research has a much wider use than is currently realised. Museums, zoos, botanic gardens and visitor centres mount exhibitions to inform the public and educate through informal learning. In the past there have been instances of exhibitions designed to influence behaviour (e.g. Lowe, 1916) but there are many instances where exhibitions could influence attitudes and behaviour yet the

content has been restricted to factual information. For example, the Ecology exhibition at the Natural History Museum (about to be refurbished) ends with a strong conservation message about human destruction of the environment but does not lead into what the solutions might be and how behaviour could be changed or encourage the visitor to take some action. This is a huge missed opportunity. Even if attitude change is not a formal objective of a particular exhibition, understanding the beliefs and attitudes of visitors can improve the overall interpretive and communication effectiveness of exhibits. To achieve this outcome information needs to be targeted at the audience, the beliefs and understanding of the audience need to be known before the information in the exhibition can be designed otherwise the designers risk completely missing their target.

The theories of behaviour change, and the Ajzen and Fishbein approach, are also relevant to countryside interpretation which is often used as a tool to manage the public. For example, a new route may be explained or a particular management practice described or the reason for a restriction explained through information and interpretation. The use of a persuasive communication targeted at the existing beliefs of the visitor would help in persuading visitors to comply with management messages. Understanding the beliefs of visitors can guide the targeting of the message to be an effective persuasive communication.

Many examples of the use of a persuasive communication come from the area of health care e.g. alcoholic treatment unit (Ajzen & Fishbein, 1980: 231), attitudes towards smoking (Marin, Marin et al, 1990). Wider use could be made of the Ajzen and Fishbein model of behaviour change in health care to persuade people to alter their health damaging life styles. Currently there is a debate about obesity and its causes. The argument about who is responsible, the consumer or the food industry, has not been resolved. The healthy living agenda would be an ideal area for a campaign targeted at the consumer using a persuasive communication.

There are limitations to the some of the results of this research. The results would

have been strengthened by the completion of more questionnaires, but the number was constrained by time and resources. The group of people interviewed were a discrete group of 'garden visitors'. The same results might not have been achieved by using the exhibit and interviewing in a place with more of the general public such as a library or shopping centre.

The very act of answering a questionnaire can influence results by forewarning the respondents of the areas of interest. In this study all the people who were followed up had answered an initial questionnaire (either pre- or post-exhibit) which could have made a difference to their responses. However, less people in the post-group were in a position to make changes as there were fewer growing plants in a garden, 83% of the pre-group compared to only 62% of the post-group grew plants in a garden.

Finally, it is very difficult to isolate effects of the visit to Chelsea Physic Garden and, in particular, the exhibit from other intervening effects such as television programmes and magazines, when looking at long term effects. The way this was done was by asking in the questionnaire: '*What changes, if any, have you made in the way you garden since reading the booklet or seeing the display*?' Followed by: '*Were these changes prompted by the booklet or the display?*' Allowing people to identify any changes made as a result of seeing the exhibit.

To isolate the effect of the visit from other effects a question was asked: '*Have you read or seen anything on television which has made any impression on the way you behave towards the environment and wildlife in your home and garden?*'

33 out of the 46 people who had seen the exhibit stated that they had read or seen something on television which affected what they did in the garden or generally. 14 out of 21 of those who had not seen the exhibit stated that they had read or seen something on television which affected what they did. The television seems to be a powerful medium with 18 references to gardening and wildlife programmes in the

people who had seen the exhibit. However, although information is being presented in these gardening programmes there was still scope for people to be encouraged to change their behaviour through the exhibit at Chelsea Physic Garden. Possibly the television programmes need to be more persuasive in encouraging the actions they promote to the public or they may not be targeting existing beliefs. Books and journals were also mentioned. One respondent stated: '*21 years ago I read 'Silent Spring'. It made a tremendous impact*' (post 12). This respondent was already gardening in a wildlife friendly way, shown by part B of their form, and felt their garden was too small to make any changes. They were also eating organically, possibly as a result of reading 'Silent Spring'. Therefore, the visit to the Chelsea Physic Garden and the exhibit on endangered plants was one influence among many others on the visitors but by setting up the exhibit deliberately to persuade visitors, enabled it to have a positive impact.

In the introduction it was stated in the Botanic Gardens Conservation Strategy (WWF & IUCN, 1989) that Botanic Gardens 'can focus public attention on the issues of conservation through appropriate educational displays and programmes'. Before displays can be designed, the level of knowledge and understanding of the visitors needs to be known. One key question which was asked of visitors was whether they are aware of the work of the Garden in conservation. What indeed was the public's perception of the role of botanic gardens? The results of this question showed that the public's perception of botanic garden work was indeed to educate and carry out conservation work. Therefore, botanic gardens are well placed to educate the public and could go much further by being much more positive in their exhibitions in aiming to influence the behaviour of visitors both in the practices they use in the garden and what they say in exhibitions and other interpretation.

The next step in this research was to look at a comparative study of another persuasive communication. This communication is a leaflet aimed at the users of Studland beach. The beach enjoys approximately 1 million visitors each year. In 1995 a leaflet was produced and given to visitors as they arrived at the car park with

the aim of putting over some key management messages to the beach users. One of the biggest management problems on Studland beach was the amount of litter which needed to be dealt with and the cost of clearing and disposing of the litter left on the beach. Surveys were undertaken both of the effect of the leaflet, by interviewing visitors, and the amount of litter on the beach, to judge the effectiveness of the persuasive communication. 325 questionnaires were completed by interview in 1995 (see Appendix 7 for questionnaire), investigating visitors' attitudes to litter and the reasons they visited Studland beach. This study forms a useful comparison to the research at Chelsea Physic Garden because the vehicle providing the communication is different, a leaflet instead of an exhibition, and the audience is a much wider group of people. The setting is also very different, the visitors have come to relax in the sun and are not necessarily in the mood to read and respond to any information. Analysis of the questionnaires would indicate how many people read the leaflet. Also how many people changed their behaviour as a result of reading the leaflet and intended to take their litter home.

Chapter 6 The use of a persuasive communication in a leaflet to persuade visitors to Studland beach to change their litter disposing behaviour

6.1 Introduction

The first research study in this thesis showed that visitors to a leisure site - such as the Chelsea Physic Garden - are to a certain extent susceptible to persuasion from information in an exhibition and will change their behaviour. To extend the scope of the research and test the usefulness of the Theory of Reasoned Action and its associated model it was decided to do a comparative study in a different leisure situation, using a different method of persuasive communication, with a more diverse group of people who may be less inclined to change their behaviour because the action involved more effort.

The research sample at Chelsea Physic Garden was a sample of the population of its visitors. These visitors were people who were on the whole interested in gardens and garden visiting. Many of these people already held beliefs and attitudes favourable to the environment in general. The persuasive communication used there increased awareness of an action and how it could be carried out. It was aided in its success by the positive environment-related attitudes and beliefs which were already present in some of the visitors.

The aim of the research at Studland beach was to see if, in a study of a different issue, with a population of people less likely to be predisposed to positive behaviour, using a different method for the persuasive communication, it was still possible to influence behaviour using a persuasive communication. This would then give an indication of the wider usefulness of applying the Ajzen and Fishbein model to behaviour change techniques in the environmental behaviour area.

Specifically the first aim of the research was to see if a persuasive communication in a free leaflet given out to visitors to Studland beach would change their litter disposing behaviours from leaving litter in bins on the beach to taking their litter home and disposing of it at home. The second aim of the research was to see if by

changing visitors' litter disposing behaviour the amount of litter collected on the beach could be reduced and also to investigate if certain activities such as the beach café contributed significantly to the litter. Additionally the study sought to investigate whether any particular type of visitor was more predisposed to taking their litter home than others which would give an indication of the audiences which may need to be targeted in different ways.

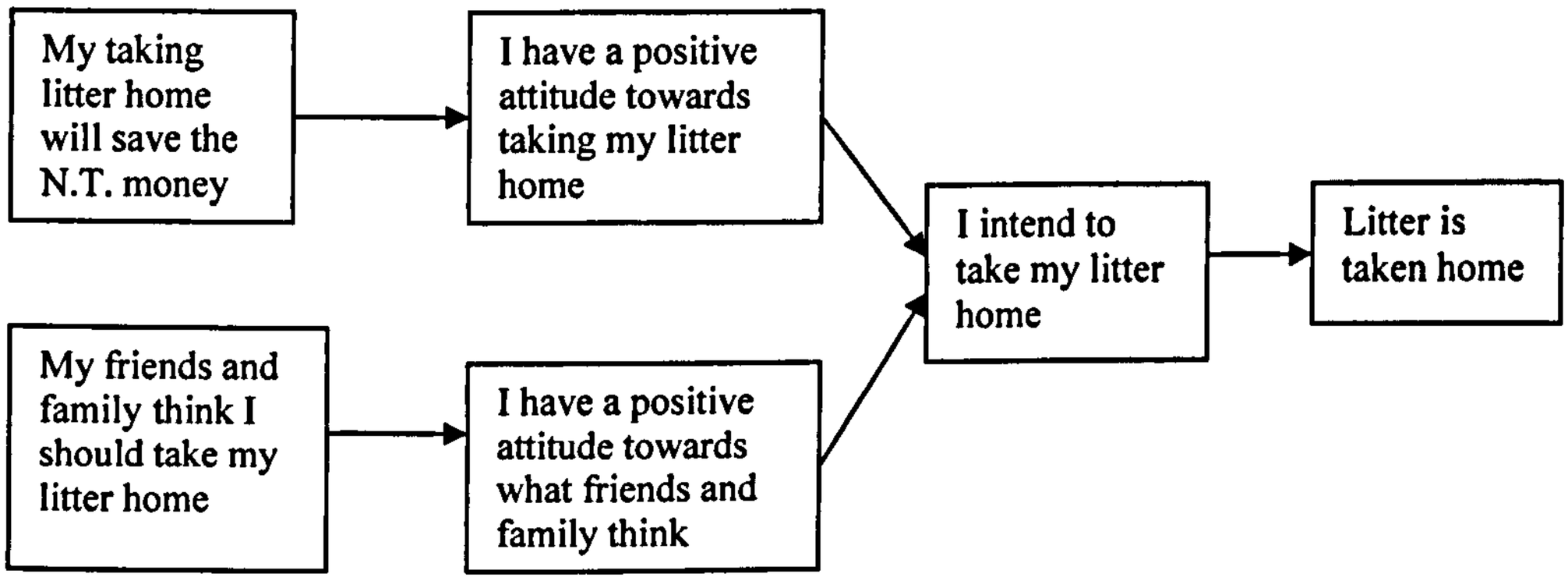


Figure 6.1 Diagram to show how influencing beliefs will alter litter disposal behaviour based on the Ajzen and Fishbein model.

Studland beach in Dorset is visited by over a million people each year. The fine sandy beaches stretch continuously for 3 miles from South Haven Point to the chalk cliffs of Handfast Point and Old Harry Rocks, and include Shell Bay and a designated naturist area. The heathland behind the beach is a National Nature Reserve, a haven for many rare birds and reptiles including sand lizards and smooth snakes. There are several public paths, two nature trails, and bird hides at Little Sea, (a mile long lake formed by the build up of sand dunes).

The influx of large numbers of visitors to the beaches in the summer months causes many management problems. One of these problems is the amount of litter left on the beach and in the bins at the end of the day. The National Trust estimated that it costs over £30,000 per year to clear up and dispose of the litter. Other management problems include visitors not clearing up after their dogs and the fire risk from use of barbecues. A leaflet was designed and given out to visitors as they entered the car parks to try to persuade visitors to take their litter home and lessen the costs of litter clearance, and also to put over some management messages such as the fire risk from

barbecues and the need to clear up after dogs. The leaflet was designed as a persuasive communication following the 'Theory of Reasoned Action' Ajzen and Fishbein (1980). The leaflet was targeted at the beach audience. It had a colourful design, little text and included a map of the area for information (see Appendix 8). The target of the communication was litter disposing behaviour, the action it was intending to influence was for visitors to take litter home and dispose of it there, the context was the beach, and the time for the action to take place was the day of the visit.

To research the effectiveness of the leaflet as a persuasive communication a structured interview of visitors was undertaken using a questionnaire format. Also a survey of the amount of litter left on the beach in the evening compared to the morning was carried out (Glavin, 1995). A measure of the total amount of litter collected from the bins and compacted was also recorded to see if any reported behaviour change had an effect on the amount of litter collected.

6.2 Litter

6.2.1 Littering behaviour

Studies have been carried out in American National Parks on littering behaviour. U.S. Forest Service data indicate that in the late 1960s $22 million were spent to clean up after campers in US National Forests ('Keep America Beautiful Inc' 1970 in Clark et al 1972). Research on the comparative effectiveness of verbal or written messages to influence littering have produce mixed results, though schemes that include a reward incentive for picking up litter have been found to be effective (Roggenbuck, 1992). A study of anti-littering messages in a leaflet distributed to campers and picnickers in campgrounds of the Uinta National Forest in Utah (UNFU) showed that the net gain in decreased litter was not sufficiently great to warrant the distribution of any type of leaflet in the circumstances of that particular study. The study used three different themes in the leaflets. The first one was reward orientated, the second theme was punishment orientated, and the third leaflet theme was neutral. Ninety percent of the groups receiving the punishment oriented leaflet

left their campsite in the same condition or cleaner than they found it. Compared to seventy-five percent of the control group (who received no leaflet), 72% of the group receiving the reward oriented leaflet and 50% of the group receiving a factual leaflet left their campsite in the same condition or cleaner than they found it. However the researchers had problems in getting leaflets into the hands of campers (achieved 65-70% of campers) and then problems in getting the campers to read the leaflet, as only 60% read the leaflet (Marler, 1971).

Ham (1983) found that proper placement of attractive innovative trash receptacles reduced littering. Clark et al (1972) showed that incentives were a far more effective method of reducing the problem of littering than traditional approaches. By offering Smokey Bear patches and pins and Junior Forest Ranger badges to children for picking up litter almost all the litter was removed. La Hart and Bailey (1975) conceptualise littering as consisting of two problems: i) How to encourage people not to throw their litter on the ground, and ii) how to motivate people to pick up litter that is already on the ground. Their study of children's littering on a nature trail attempted to cover both parts of the problem. They found that although incentives were effective in motivating children to pick up salted litter it did not keep them from depositing it on the ground later. These studies give an indication of the effectiveness of certain persuasion techniques in particular situations. However, although these studies were attempting to encourage certain behaviours in recreationists none of the studies based their attempts on behavioural change theory or the theory of reasoned action (Ajzen and Fishbein, 1980). This makes it difficult to draw a general set of rules from these studies to apply to other situations as the results are specific to the particular set of conditions of each study. The following extract defines the problem of litter on beaches:

'Litter on beaches comes from a variety of sources. The results of *Adopt-a-Beach* and *Beachwatch (Marine Conservation Society)* have identified six major sources of beach and marine litter, namely *beach visitors*, *sewage related debris* (SRD), *shipping*, *fishing*, and *other land based sources* including fly-tipping and medical. Recreational users of the beach have been found to account for the largest percentage of sourced litter in recent years and the most common

items found are crisp and sweet wrappers, drink bottles and cans and plastic food wrappers. This illustrates a low level of individual responsibility being taken for the state of the natural environment, but this can be influenced by the provision of adequate toilet and bin facilities by the local authority or beach owner, and education about the impacts of such careless behaviour.

(marine conservation website (2004) www.adoptabeach.org.uk)

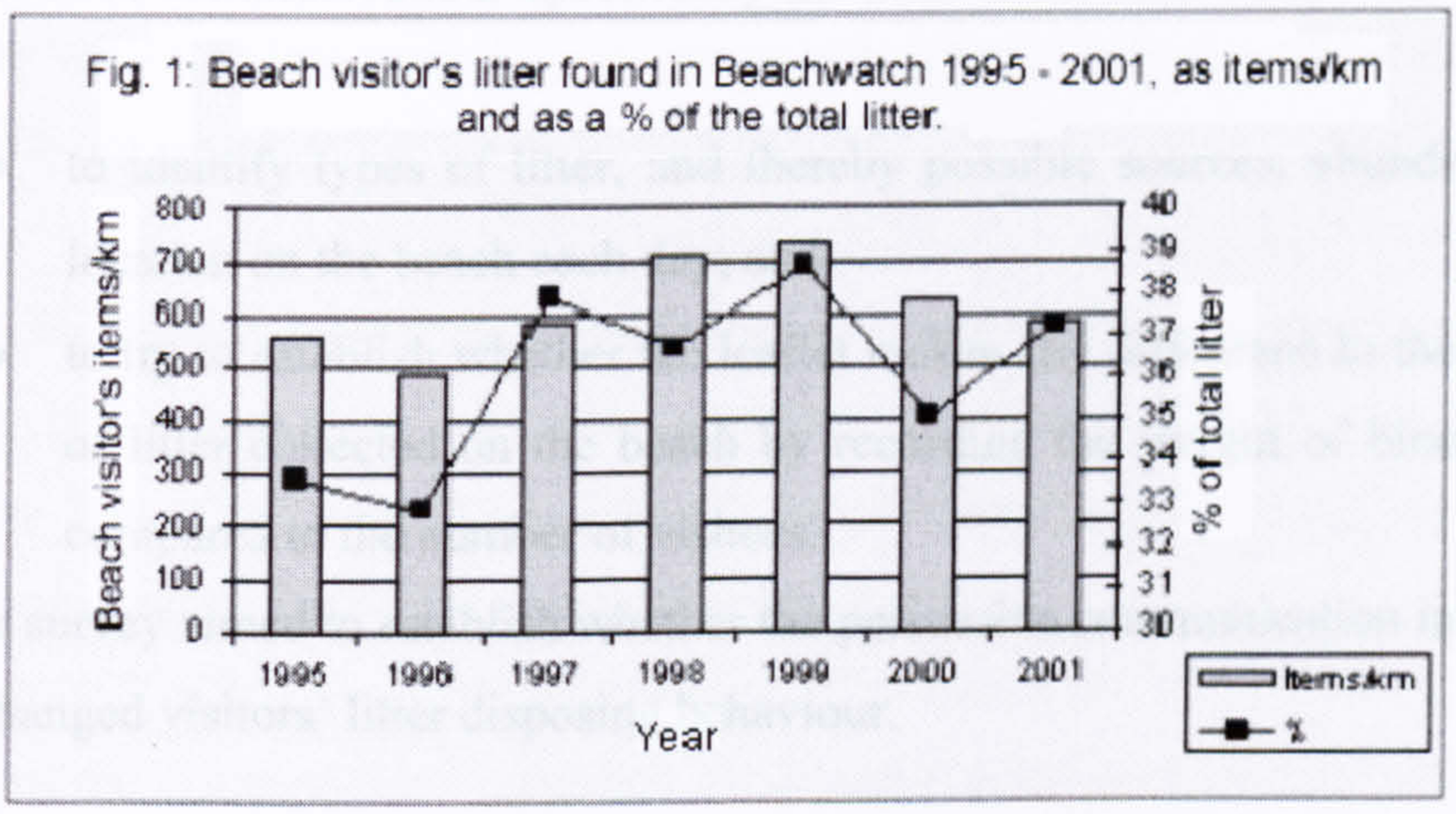


Figure 6.2 Beach visitor's litter (www.adoptabeach.org.uk, 2004)

The *Beachwatch* data illustrates that the amount of the beach visitor litter found has increased since 1995, but fallen in recent years since its peak in 1999. Despite this recent fall in beach visitor litter this source still represents the largest source of all beach litter.

The litter problem at Studland is similar to the Beachwatch study, with litter primarily from beach visitors, but there is also a localised problem of seaweed Zostera marina which is washed onto the beaches in strong east winds. There are two cafes, one on middle beach and one in the visitor centre on Knoll beach. Take-away food is served with paper plates, plastic forks and paper napkins. All these items from the restaurant contribute to the litter. Visitors to Studland in fine weather tend to be long-stay visitors, staying 4 or more hours. Inevitably this means they are bringing picnics or purchasing food which creates litter. The management practice on Studland beach is to clean the beach and empty the litter bins every night. This then encourages visitors not to litter on the beach by presenting a clean environment.

On Studland beach the need is to produce a behaviour change to encourage people to take their litter home because it would reduce the collection and compacting costs and the number of bins on the beach could be reduced.

6.3 Beach litter study aims

Therefore, it was felt that Studland beach would be a good site to explore the effect of a persuasive communication. Specifically the aims of the litter study were: -

- to identify types of litter, and thereby possible sources, abundance and location on the beach each day; and
- to try to establish whether the leaflet makes any difference to the amount of litter collected on the beach by recording the weight of binned litter compared to the number of visitors.

A visitor survey aimed to establish whether the persuasive communication in the free leaflet changed visitors' litter disposing behaviour.

6.4 Methodology

6.4.1 Visitor survey

Visitors to Studland beach arrived at one of four different National Trust car parks and passed through a pay barrier. Car park attendants offered the free leaflet to paying visitors. National Trust members did not always get offered a leaflet, as they would be waved through the pay barrier on production of a membership card. This was done to speed up the queues on busy days. Also on busy days the leaflet was not offered to every visitor. Pedestrians and cyclists did not get offered leaflets either. The visitor survey started on June 1st 1995 with a pilot of the questionnaire for testing, the leaflet was then distributed from June 16th.

The leaflet was produced jointly by the National Trust and English Nature. It was deliberately designed as a colourful, eye-catching, fun leaflet with cartoon like figures (see Appendix 8). It was designed to put over information on the importance

of the beach and nature reserve and the main management messages of taking home litter, clearing up after dogs, the location of the naturist beach and the fire risk from barbecues. A map was included to help visitors locate facilities. The text for the leaflet was trialled with local NT staff and volunteers to ensure it was clear and unambiguous. Some care was taken over deciding on the term litter; alternatives such as rubbish and waste were considered but thought to be less clear. Encams 'Survey of Public Behaviour' confirmed litter as the commonly used and understood term (Encams, www.encams.org, 2001). The persuasive communication used the high costs of litter clearance to try to persuade visitors to take their litter home (see appendix 8 for leaflet.)

> *'The National Trust and English Nature spend over £30,000 each year removing litter left on the beach and the Nature Reserves and in the bins. Please help us to keep the beach clean by taking your litter home. Let us spend this money on wildlife instead.'*

The aim of the visitor survey was to see if the leaflet made any difference to visitors' behaviour in disposing of litter. Any evidence of behaviour change would indicate success for the persuasive communication. However, direct observation of change in behaviour was difficult to do and reported behaviour was relied upon. Two different samples of visitors were compared, those visitors who received a leaflet and those who did not. The beliefs of visitors towards their behaviour on litter disposal were compared. It is the change in beliefs underlying attitude and behaviour which ultimately leads to the change in behaviour. Any record of changes in beliefs would at least indicate some success in the persuasive communication in the leaflet. Attitudes and intentions towards behaviour of taking home their litter were also compared. Any change recorded in attitude and intentions towards such behaviour would indicate some success in the persuasive communication in the leaflet.

A structured interview by questionnaire was considered the best method for researching the response to the leaflet because it enabled the information needed on visitors to be collected to determine whether the persuasive communication in the leaflet had any impact. It enabled beliefs and attitudes towards the respondent's own litter disposing behaviour to be elicited and also their intentions of disposing of their

own litter. The supplementary questions on the questionnaire also allowed a profile of the type of visitor to be made which could be used in the analysis to see if any particular type of visitor is more or less predisposed to taking their litter home. The choice was made to use a questionnaire as the research tool because it allowed the respondent to give an immediate response in the situation they were being questioned about, compared to a focus group which is often conducted away from the site and therefore divorces the respondent from the situation and may not elicit as true a response as an on the spot questionnaire. The questionnaire also allowed both open and closed questions to be used allowing a rich set of data with both forced responses and a wider variety of response from open questions. The interview technique had an advantage in that it allowed a richer set of data to be collected than by self-completion questionnaires as probing of answers was possible. Interview also allowed for ambiguous answers to questions to be clarified. The results of a structured questionnaire can be statistically analysed and a large number of people (100+) can be questioned giving reliability to the results. A focus group would only allow a small number of people to be questioned giving qualitative results.

Observation of visitors, an alternative approach, would have been possible but would have been ethically problematic also it is subject to bias in that visitors would need to be warned that they might be observed. In a beach situation it was not felt appropriate to carry out such observation.

A trial of the questionnaire was completed between 1st June and 26th June. 100 trial questionnaires, 50 of two drafts were completed in this time. This enabled the questions to be pre-tested and adjusted. The final questionnaire included more questions on demographics of the respondent and a set of attitude questions towards litter on a 5 point Likert scale. 325 questionnaires were then completed through interview of the visitors to Studland beach between 26th June and 18th August[1]. This was felt to be a representative sample of the Studland beach population taking into account limits of time and resources. Hoinville et al (1978: 61) state

'In practice the main determinate of sample size is almost always the

[1] The interviewing was carried out with the help of a trained student volunteer.

need to look separately at the results of different subgroups of the total sample. The total sample size is usually governed by the sample size required for the smallest sub group: as a rough guide, the smallest sub group will need to have between fifty and a hundred members.'

The sample size used here allows for more than forty members in three out of the six different age category groups and another two groups close to forty. This discussion is based on analysis of these 325 questionnaires.

The visitors who were questioned were located on Studland beach in the area from Middle beach exit to the boundary of the naturist beach (see map appendix 8). This was the most densely populated area of the beach which stretches from South beach to Shell Bay. The area of the beach occupied by naturists was not included because of the sensitivities of questioning people engaged in such a pursuit. Three distinct areas were identified within the stretch of beach:- Middle Beach, Knoll Beach and the visitor centre café (see leaflet appendix 8). At the café, specific tables were used for the survey. If people chose to sit at these tables they were included in the survey. The beach visitors were randomly sampled by walking the length of the survey area in a zigzag fashion. In low density areas people were interviewed every 100 paces, in medium density areas people were interviewed every 50 paces and in high density areas people were interviewed every 25 paces. People were given the choice of self-completion or were interviewed. The majority of the questionnaires were filled in by interview. Surveys took place between 10.00 and 19.00 and took between 10 and 20 minutes to complete on average. Surveys were conducted on every day of the week and in different weather conditions. The vast majority of visitors were happy to take part in the survey. Only 3 declined the opportunity. On the whole visitors gave the impression they were pleased to take part. In leisure setting people seem to have the time to give to a survey and are happy to talk.

The data from the questionnaires was numerically coded; the qualitative answers were coded using a systemic network (Bliss, Monk and Ogborn, 1983).

6.4.2 Litter survey

Litter was monitored on a series of transects along the beach. The purpose of monitoring the litter on the beach was to investigate the source of the litter and types of litter to enable positive actions to be taken to help reduce litter collected on the beach. Each transect extended at right angles from the mean high water mark through the back of the beach into the dunes. Each transect was approximately 30m long and 2m wide and there were 84 transects in total. So the approximate survey area was 5000m². 70% of the survey area was beach and 30% dunes. 21 litter bins in the survey area gave the base line transect. The distances between each base line were paced and then divided by four to produce three extra transects labelled a,b,c,d. The transect used each day varied between the four possible of a,b,c and d from each baseline (see map appendix 8b).

The litter survey commenced each morning at 08.00 when each of 21 transects was walked and litter removed. (Most litter on the beach was removed the night before by the beach wardens so this was small items of paper etc). In the evening when the beach closed at approx 19.00 the 21 transects were walked and any items of litter found on them counted and recorded on to a proforma. The totals from each transect were then entered onto a master sheet for the 21 transects that day.

6.5 Results of the litter survey

6.5.1 Types of litter, sources and abundance

The aim of the litter survey was to find out the sources and types of litter to help find solutions to reducing the litter collected on the beach. The highest frequency of litter items found were on transects closest to Middle beach car park and transects closest to Knoll beach visitor centre and car park. These were also the most heavily populated areas during the day, as some people don't tend to walk far from their cars. This was also mirrored in the dune transects. The most common types of litter were paper fragments followed by cigarette ends see Table 6.1.

Table 6.1 Total counts of different types of litter item collected on Middle and Knoll Beach and dune transects

Litter item	Middle Beach Total count during survey period	Middle Dunes Total count during survey period	Knoll Beach Total count during survey period	Knoll Dunes Total count during survey period
Paper fragments	814	346	698	358
Cigarette ends	233	73	239	120
Plastic fragments	83	29	71	23
Polystyrene fragments	66	36	22	33
Drink stirrers	43	34	95	24
Cup tops	42	23	27	13
Cups (plastic and polystyrene)	40	14	21	7
Paper bags	38	10	16	9
Plastic bags	11	43	20	37
Metal cans	16	32	20	29

A grand total of 698 paper fragments were collected on the beach transects and 358 paper fragments in the dune transects on Knoll Beach from 19 separate surveys during the survey period from 6th June to 18th August. This averaged at 36 paper fragments per day for the beach and 18 paper fragments per day for the dunes on Knoll beach from the transects. Counts were higher on Middle beach probably because it was more heavily used and there was an extra transect, 11 on Middle beach versus 10 on Knoll beach. On Knoll beach 814 paper fragments were counted for the beach and 346 paper fragments were counted for the dunes averaging 43 paper fragments per day on the beach transects and 18 paper fragments for the dune transects. Overall for 21 transects this works out at between 3 and 4 fragments of paper per beach transect and between 1 and 2 paper fragments per dune transect, which is a very low frequency of litter on the beach throughout the survey period. Less people used the dunes than the beach so it would be expected to collect less litter on the dune transects, although some litter tended to be blown by wind into the dunes. The busiest weeks on the beach where the highest number of visitors were recorded (shown by % beach cover) were the weeks when the most litter was recorded on the transects e.g. week 12, beach population cover was judged by eye to be 50-59%, 148 paper fragments collected on the beach and 32 paper fragments collected in the dunes in the survey area of Knoll and Middle beach on one survey. A number of the litter items collected were related to food and drink such as the

polystyrene cups showing that the café on Knoll beach was contributing to the litter problem by the sale of take-away food. The more heavily used areas of the beach and close to the café were where the most litter was collected. To try to reduce these items take away food needs to be served with less wrappings and paper. Cigarette ends were a significant litter item. They do not seem to be regarded by many people as an item needing to be disposed of in a bin. This is a litter item which might need a separate targeted approach to convince smokers to dispose of their cigarettes in a more environmentally friendly way than discarding on the beach.

Originally, one of the underlying premises of the litter study was to compare the volumes of litter collected between the two years, 1994 and the year of the study, 1995 when the leaflet was available. Unfortunately two problems arose: - a larger amount of litter was collected in 1995 but there was also a higher number of visitors staying longer on the beach due to the long hot summer. Also more bins were placed out on the beach by the wardens in 1995 helping to increase the volumes of litter collected. Table 6.2 indicates that on average each car was responsible for more litter in 1995 not less. However, the longer stay on the beach and the fact that more bins were used could have increased the amount of litter collected.

Table 6.2 A comparison of number of cars and litter collected over three years at Studland beach

Year	Number of cars June - August	Total litter collected in kilos	Amt of litter per car in kilos
1993	99846	81282	0.81
1994	121054	85349	0.71
1995	133347	117861	0.88

The figure for number of cars was provided by the ticket kiosks at the entrance to the car parks at Knoll beach, Middle beach and Shell Bay. This figure does not include cars parked along the Shell Bay ferry road nor people arriving on foot from the ferry who would also contribute to the litter collected. So there could be a greater number of visitors contributing to the higher litter collection in 1995 which there was no way of ascertaining as the only figures recorded each year are the cars entering the car parks.

6.6 Results - Visitor survey

One of the criticisms of using a leaflet to try and change visitors' behaviour was that the leaflet would add to the litter itself. This was found not to be the case. No leaflets were seen in bins or loose on the beach. Respondents who had received the leaflet but not read it had often left it in the car to read later (reported in the questionnaires). The results of the questionnaire survey were initially analysed to give information on the demographics of the beach visitors, why they came, what activities they were undertaking as background information on the visitors. The analysis then considered the beliefs, attitudes and behaviours of the visitors towards litter disposal, comparing the visitors who had received the welcome to Studland leaflet with those who had not to measure the success of the persuasive communication in the leaflet.

6.6.1 Visitor demographics

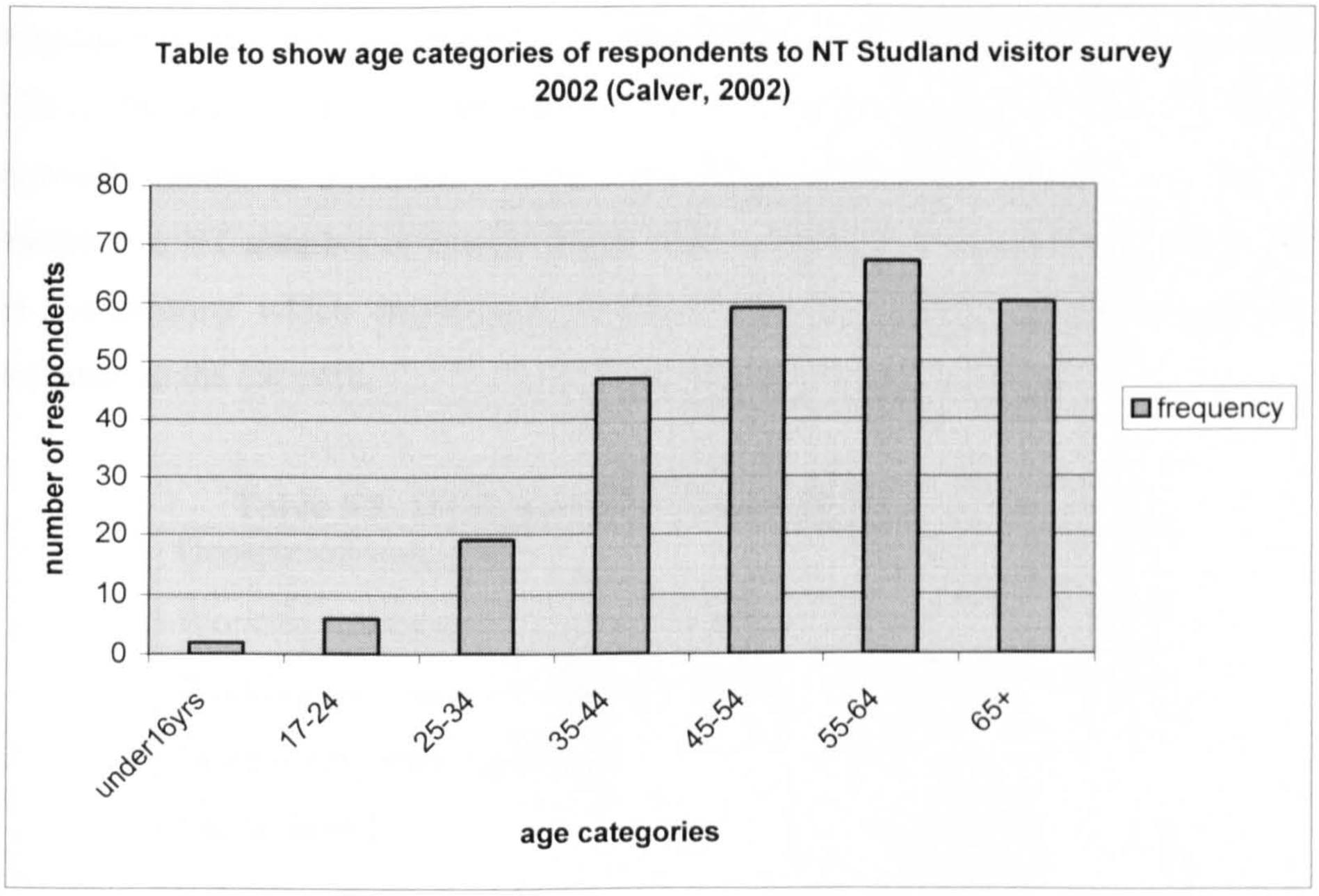
For the majority of respondents it was not a first visit to Studland (79%). Only 69 people (21%, n=325) answered 'yes' to the question 'Is this your first visit to Studland?' Of those respondents visiting more than once the majority made 2-5 visits per year 163 (63%).

Table 6.3 Age categories of respondents to the questionnaire

Age category	Count (n= 325) %
Under20yrs	24 (7%)
20-29	44 (13%)
30-39	87 (27%)
40-49	93 (29%)
50-59	39 (12%)
60+	38 (12%)

This survey shows that there was a spread of ages among the respondents with the largest category being in the 40-49 years group (Table 6.3).

Table 6.4 To show age categories of respondents to NT visitor survey (n=260)



Comparing the results of this survey with other surveys of Studland beach visitors by the National Trust (Calver, 2002, unpublished results, above Table 6.4) there is a different age spread in the Calver National Trust survey. A direct comparison cannot be made between the two surveys because the age categories used are different, but it can be seen that the Calver NT survey is skewed towards the upper age range. This may be due to the method of sampling visitors in the Calver NT survey, which relies on survey forms for self completion being given out in the visitor centre, rather than actively walking the beach. The sample used for this (1995) survey is, therefore, more likely to be an accurate measure of the typical visitor profile.

In the survey for this study many of the beach visitors were family groups, 43% of respondents came with children under 11 years old and 28% came with children between 11 and 16 years old. 33% of respondents came in groups of more than two adults.

The majority of respondents, 210 (65%), did not travel from their own home to the beach. Although the question was not asked the assumption was that most people visiting the beach were on holiday (the survey took place in the holiday period). One hundred and twenty-one people (37%) travelled under five miles to get the beach

that day. 98 people (30%) travelled between 5-14 miles. So well over half the respondents were staying locally to the beach (67%). About one third of respondents 122 (37%) were National Trust members. This is slightly higher membership than is normally found at a National Trust open space site where the ratio of non-NT member to NT member is usually 80:20. This is probably due to the car park charge in the summer which encourages people to join the Trust, as they then get free entrance to the car park.

Table 6.5 Working status of respondents

Occupation status	Count (n=325)
Working full time more than 30hrs/week	180 (55%)
Working part-time less than 30hrs/week	43 (13%)
Government training scheme	0
Unemployed	8 (2%)
Retired	34 (10%)
Out of work (illness etc)	1 (0.3%)
Housewife/househusband	25 (8%)
Full time education	34 (10%)

Table 6.6 Occupations of respondents in the survey

Occupation	Count (n=325)
Professional/managerial	154 (47%)
Clerical/administrative	47 (14%)
Technical	38 (12%)
Manual labour	17 (5%)
Service (tourism, domestic)	33 (10%)
Other	36 (11%)

Just over half the respondents were working full-time (Table 6.5) and just under half the respondents were from the professional/ managerial professions (Table 6.6). (The 'other' category included a number of students.) This seems rather high but may be due to the limited number of options available in the response categories and the categories available being open to interpretation. (For instance a plumber might classify themselves as technical or professional). On the other hand, the visitor

population on Studland beach may be skewed towards the professional end by the charge on parking in the car parks and the high proportion of NT members who are mainly from the ABC 1's category.

6.6.2 Visitor activities

Table 6.7 Showing length of intended stay by participants

Length of intended stay in hours	Count (n=325)
Less than 1	20 (6%)
1-1.9	14 (4%)
2-2.9	27 (8%)
3-3.9	28 (9%)
4-4.9	55 (17%)
5-5.9	48 (15%)
6-6.9	49 (15%)
7-7.9	41 (13%)
More than 8	42 (13%)
Not recorded	1

More people were intending to stay for 4 hours or more as opposed to less than 4 hours (73%) (Table 6.7). For visitors staying over 4 hours it was likely that they would be eating, either by picnicking or eating in the café at some point in their stay.

Table 6.8 Showing activities undertaken by respondents

Activities undertaken	Count * (n=325)
Sunbathing	271 (83%)
Swimming	204 (63%)
Walking (less than 200yds)	50 (15%)
Walking (more than 200yds)	130 (40%)
Walking (more than 1 mile)	120 (37%)
Walking a dog	39 (12%)
Cycling	16 (5%)
Picnicking	199 (61%)
Boating	55 (17%)
Playing games	46 (14%)
Rock pooling	5 (2%)
Studying	2 (1%)

*multiple activities were possible

The combination of the fact that a large proportion of the visitors were picnicking and that 73% were staying more than 4 hours (Table 6.8) would suggest that many of them would be generating some kind of litter which would need disposal. So the

information in the leaflet on litter disposal would be relevant to more than three quarters of the respondents.

6.6.3 Beliefs about Studland

Two questions on the questionnaire elicited information from respondents on their feelings about Studland beach, which could underlie the beliefs related to attitudes about disposing of litter.

Q 14 Why did you choose to come to Studland?
Q 15 Is this area special to you in any way? –If yes -What is special about it?

Most respondents answered the first question in terms of 'Why did you choose to come to Studland rather than any other beach in the area?' A few respondents answered in terms of why they chose to come to the beach that day rather than undertake some other activity and gave answers such as 'good weather'.

These two open questions were analysed by the use of systemic networks (Bliss, Monk and Ogborn, 1983). This method was chosen because it allowed distinctions between responses to be drawn at different levels, broad to fine, and analysis to take place at different levels. The reliability of the coding was not tested independently because the responses on the whole were not complex and categories for responses were evident. The codes for these responses were entered onto a spreadsheet.

At the finest level of coding the most popular response people gave as to why they chose Studland was for the beach (140), also because it is lovely/ beautiful (45), it was recommended (33) for the sea (32), the weather was good or it was a beautiful/sunny day (21). Fourteen respondents said they chose Studland because the beach was clean (Table 6.10). The responses were then grouped under broad categories:

- Responses to the environment,
- Responses about facilities,
- Other responses including patterns of visiting and convenience.

A total of 444 responses were given to this question.

Table 6.9 Broad categories of the responses to the question, 'Why did you choose to come to Studland?'

Response category	Count (n=444)
Responses about the environment and scenery	295 (66%)
Responses about facilities	29 (6%)
Other responses including patterns of visiting and convenience	120 (27%)

The overwhelming majority of responses to the question of why individuals chose to come to Studland were about the environment, including the quality of the environment. This would indicate that visitors would be keen to maintain that high quality of environment and be positively disposed to keeping the area free of litter.

Table 6.10 Detail of responses to the questions 'Why did you choose to come to Studland?' and 'Is this area special to you in any way?'

Categories of response to question-	Fine categories	Why did you choose to come to Studland today? (count)	Is this area special to you in any way?(count)
Environment responses	**Environment-beach**	140	10
Beach	Clean	14	89
	Sandy	19	39
	Safe	6	49
	Quiet/peaceful	4	20
	Lovely/nice	45	23
	Sheltered	2	2
	Accessible	2	12
	Large	0	3
	Naturist beach	2	4
	Sea	32	8
	Nature reserve	5	2
	Sand dunes	1	7
	Wildlife	0	1
	Heathland	1	1
	Walks	6	3
Scenery responses	**General environment**	3	7
	Scenery	5	58
	Unspoilt/non-commercial	4	39
	Natural	1	58
	Views	2	1
	Variety	1	8
Facility responses	**General facilities**	4	15
	Allows dogs	1	12
	Parking	5	2
	Family orientated	3	11
	Catering	3	2
	Shop		1
	Boats/slipway	8	4
	Beach huts	3	
	Water sports	2	5
Other responses	**Other**		
	Weather-good	21	
	Convenience/close to home	17	1
	Recommended	33	
	Like it/favourite	18	3
	Sentimental reasons	1	21
	Been before	5	4
	Show/meet friends	4	
	On route	4	
	Horse riding	1	
	On holiday	4	
	Out of interest	5	1
	Work/study	3	
	Other	4	5
	Total	444	531

The majority of respondents felt that Studland was special in some way 278 (85%).

Table 6.11 Broad categories of response to the question 'Is this area special to you in any way?'

Response category	Count
Responses about the environment	444
Responses about facilities	52
Other responses	35

*multiple responses were made

The environment was again very important in why Studland was special to visitors. In particular the clean (89), sandy (39), and safe (49) beach. The scenery (58), the natural environment (58) and the fact that the place was not commercialised (39) were all important (Table 6.10). The fact that many visitors believed that the beach was clean and that this was an influence on their visit was important for the effectiveness of the persuasive communication. It indicates that visitors came with a positive attitude to how the beach looked and believed that the place was special because it was clean. They were likely, therefore, to have positive attitudes and underlying beliefs towards removing their litter to bins and negative attitudes towards creating litter and leaving it on the beach. If the visitors already have positive attitudes towards litter removal it should not be a major change in attitude and behaviour from putting litter in bins to taking litter home.

Did respondents believe there was anything that could be done to improve the area? 53% answered 'yes' to this question. There were a variety of responses on what could be done to improve the area such as removing seaweed from the beach, improving catering, limiting the number of people on the beach in busy periods and providing access for wheelchairs to the beach. Only two respondents mentioned improvements connected with litter and these were a) less paper packaging b) providing recycling facilities in car park. However, many respondents spontaneously suggested that they could remove their own litter as a way to help improve the area in response to question 17 'What can you yourself do to help improve the area' (Table 6.12).

Table 6.12 Responses to the question 'What can you yourself do to help improve the area?'

Categories of response to the question 'What can you yourself do to help improve the area?'	Count (n= 273)
Take rubbish home	32 (12%)
Put rubbish in bin	224 (82%)
Respect natural environment	9 (3%)
Leave car at home	2 (0.7%)
Clear up dog mess	1 (0.3%)
Other	5 (2%)

Visitors were asked if in their opinion there was a problem with litter on the beach. 43 people (13%) answered affirmatively. 43 people gave further comments including 23 who stated it was a minor problem, and four who stated cigarette ends were a problem. In general the majority of respondents did not think there was a problem with litter on the beach.

6.6.4 Beliefs about litter

Visitors' beliefs concerning litter and their behaviour with litter were tested by a series of questions using a 5-point Likert scale. The data for visitors' beliefs is as follows (Table 6.13): -

Table 6.13 Visitors' beliefs concerning litter

	Agree strongly	Agree	No opinion	Disagree	Disagree strongly
Litter can be harmful to wildlife	283	41	0	1	0
Studland is an important area for wildlife	252	44	27	2	0
By taking litter home I will help conserve the Studland environment	259	63	1	1	0
By taking my rubbish home I will save the National Trust money	164	143	7	10	0
Dog owners should be prepared to clean up after their dogs with a pooper scoop	313	6	2	4	0
Stopping the sale of food near the beach would improve the beach environment	8	38	22	246	11

The responses to the questions showed that visitors strongly believed that litter is harmful to wildlife and that Studland is an important area for wildlife. They also believed strongly that by taking litter home they would help conserve the Studland environment and they would save the National Trust money. They also believed that dog owners should be prepared to clean up after their dogs with a pooper-scoop. They did not believe that stopping sale of food near the beach would improve the beach environment.

6.6.5 Visitor attitudes towards litter

Attitudes towards litter were researched by using a similar 5-point Likert scale for a question on litter disposal: '*I should take my rubbish home and recycle it*'
Visitors had a strong positive attitude toward the behaviour of taking rubbish home

and recycling it. 92% agreed or agreed strongly that they should take their rubbish home and recycle it.

6.6.6 Visitors' behaviour towards litter

On behaviour itself the majority 204 (63%) intended to use the litter bin on the beach (Table 6.14) with the remainder intending to take their litter home (37%). Although no respondents reported that they intended to bury their rubbish on the beach this response was included because beach users had been observed burying cigarette ends. Ajzen and Fishbein have shown that intention to perform an act is a reliable predictor of the act being performed. 'Considerable research demonstrates that, when properly measured, correspondent intentions are very accurate predictors of most social behaviors'. (Fishbein and Manfredo in Manfredo 1992: 33)

Table 6.14 Respondents intentions with their rubbish

If you have waste or rubbish at the end of your visit, what do you intend to do with it?	Count (n=325)
Bury it on the beach	0
Put in litter bin on beach	204 (63%)
Take home and put in litter bin	61 (19%)
Take home and recycle	60 (18%)
Other	0

Although 179 visitors (55%) had strong positive attitudes towards taking their litter home for recycling i.e. they agreed strongly with the statement 'I should take my rubbish home and recycle it.' and 120 (37%) agreed with the statement, 92% in total, this attitude translates into an intention for 60 (18%) to recycle with a further 61 (19%) intending to take their litter home i.e. 37% in total. This shows a disparity between beliefs, attitudes and intentions. According to the Ajzen and Fishbein (1980) model, positive beliefs and attitudes towards an action should lead to positive intentions and the behaviour being undertaken. This disparity between beliefs, attitudes and intentions offers three hypotheses.

1. The data for the beliefs and attitudes is not valid and individuals have not expressed genuine beliefs;
2. 55% (i.e. the difference between those showing positive attitudes to the action and those already intending to take their litter home) are open to

persuasion and their positive beliefs and attitudes have not yet translated into intention and behaviour;

3. A barrier prevents the positive attitude being translated into intention.

It is possible that respondents recorded more positive beliefs and attitudes in the questionnaire than they actually possessed, as there is a tendency when being interviewed to try to please the interviewer whereas self completion questionnaires can gain more honest answers (S. Calver pers. comm.). If this were the case then I would expect the intentions to be similarly positive. There may be something which gets in the way of performing the behaviour or an alternative suggestion is that although only 37% of respondents are intending to follow the behaviour sought i.e. taking their litter home, many of the visitors (55%) have positive attitudes towards the action and could therefore probably be persuaded to do so.

6.6.7 Did the persuasive communication in the leaflet have any effect on the rubbish disposal intentions of visitors?

158 visitors (48.6%) of those surveyed received the welcome to Studland leaflet. Of these 115 visitors (73%) stated that they had looked at the leaflet, which is a good proportion of visitors who received the leaflet and shows that the eye-catching design worked. Of those that had looked at the leaflet 49 (43%) said they would take home their litter compared to 66 (57%) who stated they would put their litter in the bin on the beach. 73 (35%) visitors who had not looked at the leaflet said they would take their litter home compared to 136 (65%) who would put it in the bin on the beach.

Table 6.15 To compare the intended litter disposal with looking at leaflet

	Looked at leaflet	Not looked at leaflet	Totals
Bin on beach	66 (57%)	136 (65%)	202
Take home	49 (43%)	73 (35%)	122
Totals	115	209	

There is a visible shift with a higher proportion of people who had looked at the leaflet intending to take their litter home and either put in bin or recycle. 35% of

visitors who had not looked at the leaflet intended to take their rubbish home compared to 43% of visitors who had looked at the leaflet an 8% difference. To see whether there is any relationship between looking at a leaflet and disposing of rubbish the chi squared test was used. This is a test where the observed results are compared with data which would be obtained if there were no relationship between the variables. The chi-squared calculation tests the null hypothesis that there is no association between the leaflet and what visitors intend to do with their rubbish. The chi-squared value for the figures in Table 6.15 is 1.7 with 1 d.f. At the 5% level, with 1 degree of freedom chi-squared needs to be 3.841 to reject the null hypothesis showing no association. Since our figure is less than 3.841, the null hypothesis is accepted at the 5% level i.e. there is no association linking looking at the leaflet and litter disposing intentions. However, there was a shift in intention in the right direction with a higher proportion of those that looked at the leaflet intending to take their litter home although not a significant number. This is a somewhat disappointing result which could indicate that it takes more than a persuasive communication in a leaflet to encourage visitors to take their litter home.

6.6.8 Theory of planned behaviour

This may be a case where the modified version of Ajzen and Fishbein's Theory of Reasoned Action (TRA), the Theory of Planned Behavior, is relevant. The Theory of Planned Behavior (TPB) suggests that in addition to the attitudinal and normative influences identified by the TRA, a third element – perceived behavioural control – also influences behavioural intention, and adds perceived behavioural control (PBC) as a third predictor of intention. PBC refers to the person's perception of the ease or difficulty of performing the behaviour. PBC is a function of a person's beliefs about the resources and obstacles relevant to the performance of the behaviour (O'Keefe, 2002). It forms part of the modified model, the Theory of Planned Behaviour. In this case there may well be a perceived difficulty in performing the behaviour of taking litter home and disposing of it as many of the visitors are on holiday and staying in campsites and guesthouses. Also the effort of carrying litter back to the car along with picnic baskets and rugs may be an additional difficulty, as the attitudes towards the action of taking litter home and recycling it were strong. This is an area worthy of further investigation. If the PBC were to be investigated and then aided a higher

intention to perform the behaviour might result.

6.6.9 Visitor type and litter disposing behaviour

To see if there was any difference in litter disposing intention between the different groups of visitors two cross tabulations were carried out; litter disposing behaviour compared to membership of National Trust; and litter disposing behaviour compared to age (Tables 6.16 and 6.17).

Table 6.16 To show whether there is any link between being a National Trust (NT) member and litter disposing intention

	NT member	Not NT member	Totals
Litter in bin on beach	73 (60%)	131 (64%)	204
Take litter home	22 (18%)	39 (19%)	61
Take litter home and recycle	27 (22%)	33 (16%)	60
Totals	122	203	

A slightly higher proportion of NT members were intending to take their litter home and recycle it. However, when tested for any association between NT membership and litter disposing behaviour using chi-squared, no significance was found.

Chi-squared = 1.74 with 2d.f. To show any association chi-squared would need to be equal or greater than 5.99 at the 5% level.

Table 6.17 Table to show whether there is any link between age and litter disposing behaviour

	Under 20yrs	20-29yrs	30-39yrs	40-49yrs	50-59yrs	More than 60yrs	Total
No response						1	1
Bin on beach	16 (66%)	31 (70%)	55 (63%)	59 (63%)	23 (59%)	20 (53%)	204
Take litter home	4 (16%)	7(16%)	15 (17%)	20 (21%)	5 (13%)	10 (26%)	61
Take litter home and recycle	4 (16%)	6 (14%)	17 (19%)	15 (16%)	11 (28%)	7 (18%)	60
Total	24	44	87	94	39	38	

Table 6.17 shows as age increases the intention to take litter home increases with the

60+ age group having the highest proportion intending to take their litter home rather than use the bin on the beach. The 50-59 years age group has the highest percentage intending to take their litter home and recycle. Chi squared is calculated as 6.74. For significance at the 5% level with 10 degrees of freedom the figure needs to be 18.31 or greater to show an association between age and litter disposing behaviour.

6.6.10 Other effects of the leaflet

The leaflet had a number of other positive effects over and above its small but not significant influence on actions with litter. 73 people out of 115 people (63%) who had read the leaflet said they learnt something new about the area from the leaflet. This included the wildlife and nature reserves, nature trails, facilities and, interestingly, the cost of litter collection (see Table 6.18). The impact of the persuasion messages in the leaflet showed through in the answers to this question in that 7% of the responses mentioned the cost of litter collection as something new they had learnt about the area. This shows that some visitors were attending to this message in the leaflet. The messages on the importance of wildlife in the area had a big impact with 52% mentioning wildlife as something new they had found out about from the leaflet. This message reinforces the belief that the area is special and should be cared for by visitors.

Table 6.18 To show the areas of information which were found out from the leaflet

Category	Number of responses (n=72)*
Wildlife/nature reserves	45 (52%)
Facilities	13 (15%)
Naturist beach	11 (13%)
Cost of litter collection	6 (7%)
Ownership of area	4 (5%)
Dog regulations	3 (3%)
Other comments	4 (5%)
Total	86

*multiple responses were given from 72 respondents.

In response to the question, 'What was the most useful information in the leaflet?' The cost of rubbish removal came up 4 times in a total of 119 responses by 102 respondents. Again multiple responses were possible.

6.7. Conclusions

The aim of the study was to investigate whether a persuasive communication in a free leaflet could change the litter disposing behaviour of visitors to Studland, from putting their litter in the bin to taking it home. The Theory of Reasoned Action model of Ajzen and Fishbein (1980) was used to guide the investigation. The persuasive communication in the leaflet introduced a novel belief that taking litter home would save the National Trust money, which could then be used for looking after the wildlife of the area. The research showed that there was a small effect with a higher proportion of visitors who had read the leaflet intending to take their litter home. However the difference in the number of visitors who had and had not read the leaflet and those who were prepared to take their litter home was not statistically significant. The research results showed strong positive attitudes towards taking litter home from the answers in the questionnaire. According to the Ajzen and Fishbein Theory of Reasoned Action a strong positive attitude towards taking litter home and disposing of it should lead to an intention to take litter home and dispose of it. In this case this has happened but not significantly, 37% of respondents intend to take their litter home out of a possible 92% with positive attitudes to taking home their litter.

The other component of the behaviour that might influence the intention is the normative component - what my friends and relations think I should do with my litter. In this particular circumstance the normative component was not investigated as it did not seem a likely determinant of litter disposing behaviour, because in this situation it did not seem that normative pressures were strong. The normative component describes what relevant others (i.e. friends and family) think about the person performing the behaviour and the persons motivation to comply with what they think. It is possible that environmentally aware children might put pressure on their parents to take litter home and recycle it, and in the case of a group of teenagers there might be strong peer pressures in action. But in the beach situation there does not seem to be any indication of strong pressure from others to dispose of litter in a particular way and it does not look likely that there is a strong normative influence working against the attitude and behaviour in question. The answers to the questionnaire did not give any indication of a normative influence but it is an area

which would merit further study. The other possibility is that perceived behavioural control (PBC) is having an effect on the intention. PBC refers to the person's perception of ease or difficulty of performing the behaviour. In this situation, there may well be obstacles to taking litter home such as lack of spare bags to collect rubbish, too many things to carry or not prepared to make the effort. O'Keefe (2002) states that:

> 'The lack of a well-articulated and well-evidenced account of the determinants of PBC, however, means that there is less guidance than one might like concerning specific means of influencing PBC.'(O'Keefe, 2002: 117)

He goes on to describe four possible methods of influence; directly removing an obstacle to behavioural performance, which could be lack of relevant information; creating an opportunity for successful performance of the behaviour in question ("I've done it before so I can do it again"); provide examples of others performing the action successfully ("if they can do it I can do it"); and a simple encouragement ("you can do it"). There is however, very little research concerning the effects of these different mechanisms and less evidence on how effective they are. In the Studland situation the second option of creating an opportunity for successful performance of the behaviour would be possible. The exact nature of the barrier to action would need to be investigated by further questions in a questionnaire and the possible obstacle could then be removed. For instance, a biodegradable bag could be made available to visitors to put their rubbish in and remove to their homes.

Another possibility that might have affected the intention to carry out the behaviour is that people did not attend to the leaflet's messages. However the evidence here (Table 6.18) is that people did in fact attend to the message and a few spontaneously repeated back information from the message. Other researchers have suggested that incentives increase the likelihood of the required behaviour taking place. Perhaps it is just too easy to leave the litter in a nearby bin and an incentive is needed to persuade visitors to take their litter away. Although it is the practice in some areas of Britain to expect visitors to take their litter home and not provide bins e.g. some lay-bys in Britain have no litter bins and have signs for car drivers encouraging them to

take their litter away, it may not be enough of a normal practice to encourage people to do it in the beach situation.

6.7.1 Sources of error

These results show an interesting anomaly that the attitudes towards the action are positive in 92% of the respondents but this translates into intentions and behaviour in only 37% of respondents. A slightly higher proportion of those visitors who had looked at the leaflet intended to carry out the action of taking litter home compared to those visitors who had not looked at the leaflet. Are people really showing their true attitude in answering the questionnaire or giving what they believe is the 'right' answer? There is no evidence to suggest that respondents are not being honest in their responses but it leaves the question as to why there is a difference between people's attitudes and their intentions. There may be a methodological problem here in that the questionnaire may have presented questions which did not allow respondents to give an honest answer because it would have placed some doubt on their moral values. There is some evidence that respondents to questionnaires when interviewed tend to try to please the interviewer whereas in self-completion questionnaires they are more honest (S. Calver pers. comm.). A strategy to eliminate this possibility might be to use more than one type of question to find out people's attitudes. This would then allow a check for consistency between responses.

Does the fact that a higher proportion of people that looked at the leaflet intend to take their litter home indicate that the leaflet caused the effect or are there other possible explanations? In that the correlation is not significant when tested with chi-squared this does indicate that it could be caused by chance. Also, there could be some other difference between the group who read the leaflet and the group who did not, which accounts for the difference in litter disposing intentions. For instance, it is possible that the people who looked at the leaflet were more literate and environmentally inclined and therefore more likely to take their litter home compared to the people who did not look at the leaflet. To ensure that there were not differences between the two groups the respondents for the questionnaires were picked randomly. To check for other differences which might have occurred even though the respondents were picked randomly a comparison of age was done

between the group who looked at the leaflet and the group who did not.

Table 6.19 Table to show a comparison of age and those that looked at the 'Welcome to Studland leaflet'

	Under 20yrs	20-29yrs	30-39yrs	40-49yrs	50-59yrs	More than 60yrs
Looked at leaflet	5 (4%)	12 (10%)	31 (27%)	28 (24%)	19 (16%)	20 (17%)
Not looked at leaflet	19 (9%)	32 (15%)	55 (26%)	65 (31%)	20 (10%)	18 (9%)

In fact there is a significant difference between age and those that looked at the leaflet, chi squared = 12.5 with 5 degrees of freedom, p is less than or equal to 0.05. There is an association between age category and those people who did and did not look at the leaflet. More people in the older age categories (50+ years) looked at the leaflet than did not look at the leaflet. This could affect the results as older people might be more inclined to take their litter home and the sample was skewed towards the elderly.

However, a number of factors suggest that in fact the leaflet is having some effect. The fact that a number of respondents mentioned the cost of litter removal showed that they had attended to the messages and the number of responses in general on the usefulness of the leaflet indicated the effectiveness of the leaflet. Also the fact that there was a slight increase in the number of respondents who stated they would take their litter home in those that had read the leaflet and that very few leaflets were found as litter or in the bins.

The difference between respondents' positive attitudes toward taking litter home and the lack of translation into intentions could be caused by a barrier or barriers to their being able to achieve the behaviour sought – of taking their litter home. This study shows the effect of a persuasive communication in a leaflet based on the original model of Ajzen and Fishbein in the context of Studland beach. The model itself is found to be insufficient to explain the data. Rather, the more recent modified Theory of Planned Behavior may be a better account for the data. This upholds the Theory of Planned Behavior as a useful modification of the Theory of Reasoned Action.

The conclusion to draw from this research study is that a persuasive communication in a leaflet can be effective but to change truly a behaviour such as taking litter home, because it requires some effort on the part of the visitor, may need an incentive or coercion or at least more than one method of persuasion. Carter (2001) suggests that effective communication initiatives should use multiple communication channels and/or media to be most effective. Further research at Studland could investigate the use of more than one media type to convey the persuasive message.

To investigate further the applicability of the Theory of Reasoned Action to behaviour change in an environmental setting, a third study was undertaken attempting to change the behaviour of visitors at a World Heritage Site through using a different persuasive communication. The problem of erosion control and persuading visitors to keep off eroded areas was researched with the results reported in chapter 7.

Chapter 7 The effect of a persuasive communication on visitors' attitudes and behaviour towards erosion at Avebury

7.1 Introduction

This third case study investigates the effect that a persuasive communication in a leaflet has on visitors' attitudes and behaviour to erosion at a popular visitor site. It develops the research a further stage by looking in depth at the beliefs visitors hold before using this information to write a persuasive communication. The previous research study on Studland beach introduced some novel information to change beliefs and attitudes to litter disposing behaviour; in contrast this study researches the existing beliefs then uses this information to guide the persuasive communication. At the start of this study it was felt that there was little understanding of the beliefs that visitors may hold with respect to erosion, so the first part of the study concentrated on finding out more about visitors' beliefs in order to use the persuasive communication on these underlying beliefs to change attitudes and behaviour. This study tests the usefulness of the Theory of Reasoned Action and its associated model in a third situation to provide a comparison to the previous two studies. Avebury is a contrasting site to the previous two studies as it is open access and there is no charge for entry. As a key archaeological monument and World Heritage Site it attracts a wide range of visitors, including many coach tour groups, who come to see the stone circles and associated monuments. The behaviour change sought at Avebury is more difficult than the previous studies because it depends on visitors understanding their impact on the monument and being prepared to act differently, possibly restricting their behaviour, for example by not walking up the sides of the steep henge banks.

Avebury, Wiltshire, is the site of a Neolithic stone henge and other monuments visited by around 350,000 people a year. The sheer volume of visitors on the chalk banks surrounding the henge causes erosion problems which have to be managed in a sustainable way. If visitors could be persuaded to avoid the most vulnerable areas, management of the site for future generations would be enhanced. The use of a

persuasive communication in the form of a leaflet was investigated to research whether it could change the way a visitor behaves at Avebury.

Research into visitor responses to erosion has mainly been carried out in the United States of America. Johnson and Swearingen (1992) have conducted a study of the effect of different sign texts designed to discourage hikers from using trails liable to damage through overuse. Six different sign texts and design options were compared:

1. the standard signs used in the past at the site ('No hiking, meadow repairs');
2. newly designed signs giving a less cryptic explanation of desired behaviour ('Stay on the paved trails and preserve the meadow');
3. a symbolic message showing an international prohibition sign (a red circle with a cross hatch) over a hiker's profile;
4. a hybrid sign with the symbol above combined with the text 'No off-trail hiking';
5. sanction signs ('Off trail hikers may be fined');
6. a humorous message ('Do not – tread, mosey, hop, trample, step, plod, tip-toe, trot, traipse, meander, creep, prance, amble, jog, trudge, march, stomp, toddle, jump, stumble, trod, sprint or walk on the plants').

The results from observing actual behaviour on a large sample (with minimum numbers in any sub group being 1,463), showed the sanction sign (5) was significantly more effective than any other type, reducing off trail hiking from 6.9% (control) to 1.7%. Of the others signs 2, 4 and 6 were equally effective, reducing off trail hiking to about 3.5%. The standard sign (1) was not as effective as signs 2, 4 and 6 and the symbol only sign was not effective. The authors warn against the uncritical use of sanction signs, as they are only effective if the sanctions are enforced and they may reduce the quality of a visitor's experience. They suggest that they should be used as a solution where the sanctions mentioned can be enforced and where the consequences of undesired behaviour are serious. Cole (1983a in Manfredo, 1992) suggests that 'trail deterioration problems are probably more closely related to soil characteristics, vegetation types, landforms and design features than to the amount of use'.

Roggenbuck (in Manfredo, 1992) summarises perceptions of environmental degradation from research mostly undertaken in America. He finds that 'By far the most common visitor response to environmental deterioration in recreation settings is a failure to even notice the deterioration.' Similarly Helgath (1975 in Manfredo 1992 : 159) 'found hikers to be well satisfied with trail conditions in the Selway-Bitterroot Wilderness, even though many trails there were severely eroded.'

In contrast a few studies have demonstrated that park visitors sometimes noticed environmental impacts, but these impacts did not seem to affect the enjoyable experience. Several studies noted certain kinds of environmental impacts, particularly those caused by thoughtless behaviour, did cause negative reactions in park visitors. The main impact mentioned was litter. This can increase the perception that the site is overused (Roggenbuck, in Manfredo 1992). In conclusion, the studies quoted above indicate that, in many instances, there is a lack of awareness of erosion amongst visitors.

7.2 The Theory of Ajzen and Fishbein

As before, using the theory of Ajzen and Fishbein (1980), in order to influence a person's behaviour, the beliefs underlying the attitude toward the behaviour need to be influenced. The beliefs underlying a person's attitude toward a behaviour are termed behavioural beliefs and beliefs underlying a person's subjective norm are termed normative beliefs. These beliefs can be changed by exposure to information such as in a persuasive communication.

In the study at Avebury the Ajzen and Fishbein model might look as Fig 7.1.

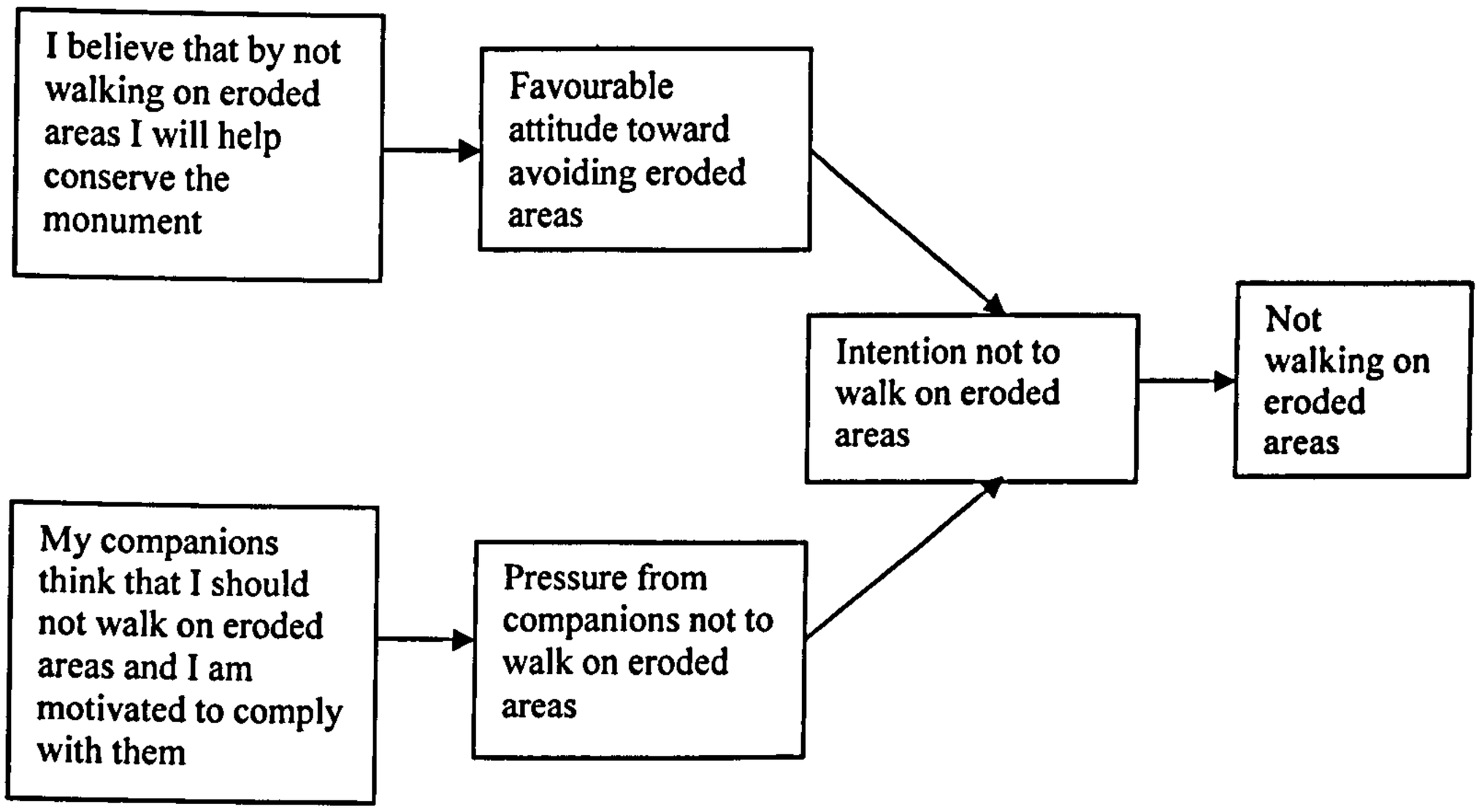


Figure 7.1 Ajzen and Fishbein model applied to Avebury study

However, in reality it is probably a number of beliefs which underlie the attitude towards walking on eroded areas at Avebury. For example, beliefs might include: my own walking contributes to erosion; everyone's visit has some impact on the site; I can mitigate my contribution to erosion by being careful where I walk; my walking up the steep banks rather than sticking to the paths causes erosion. Or indeed - what difference does one more footstep make, I'll walk where I like.

Using the Ajzen and Fishbein model this study had three parts. The first part in 1999 used a questionnaire to elicit the salient beliefs of visitors at Avebury towards their contribution to erosion of the monument. This information was then used to produce a persuasive communication in a leaflet to persuade visitors not to walk on paths marked with erosion control signs and to keep out of fenced off areas. This leaflet was then evaluated using two different questionnaires in 2002 and 2004.

Unfortunately the message at Avebury is not the simple one of just 'keep to the paths', because the policy is one of dispersal around the standing stones themselves, on the flat inner area of the henge, where there are no paths. No defined route around the four quadrants of the henge is given in the hope that visitors choosing their own routes around the stones will spread the load over the site (see leaflet in Appendix 10 to see map showing four quadrants dissected by roads). Choosing a route without

signed footpaths can be confusing for visitors who are not sure where to walk, but it does enable erosion control to take place on some routes while allowing alternatives to be used by visitors. Surrounding the stones are a large bank and ditch, there are clear paths up to the tops of the henge banks and paths on the top of these banks around the four quadrants of the henge. The main areas of erosion are on the sides of the steep henge banks and ditches both on the paths and on the grassy sides where visitors have taken short cuts and followed sheep paths. Erosion control takes place each spring when areas are roped off and reseeded. Signs are displayed explaining the work taking place (Appendix 12). The erosion control areas are usually open by Easter each year. In some years there may be specific work taking place later in the year.

7.3 Background

Two years of market research at Avebury (Calver, 1988 unpublished) has enabled segmentation of visitors into the different visitor groups. Also the number of people visiting Avebury each year has been established using two mechanical counters, one at the footpath exit from the car park and one in the main area where the shop, restaurant and museums are situated. The mechanical count has been backed up by car park counts and counts done by people at other entrances. This data has established that around 350,000 people visit Avebury each year, a substantial number of visitors for the 0.5km² core of the site, which inevitably has an impact on the site. These visitors can be grouped according to their key characteristics into six main groups, established from visitor survey questionnaires between December 1996 and January 1998 when a total of 2825 questionnaires were completed. The six groups are identified as:

19% archaeological/historical interest,

18% environmental interest,

17% local day-trippers,

16% spiritually motivated,

15% day-trippers,

12% casual non/specific.

(See Appendix 11 for more detail on these visitor groups).

Approximately 19% of visitors each year are repeat visitors.

There are a number of routes visitors can take around the henge monument. A popular route is to walk on top of the grassy henge bank which surrounds the stone circles. The steep access routes up to these banks and the tops of the banks suffer erosion due to a combination of the thin chalk soils, the large number of visitors, and the wet weather.

Combinations of different management techniques are being used to help contain erosion whilst allowing visitors freedom to roam. These include: -

- temporary barriers at key points with notices suggesting alternative routes, allowing the grass to recover;
- roped off areas with explanatory notices to show alternative routes;
- mown paths to encourage visitors to use certain routes;
- a pack of walks, which aims to spread the movement of visitors by showing walking routes to other monuments, except within the henge area itself where no set route is indicated.

In addition the National Trust management plan identifies a number of measures which might be used to mitigate erosion:

1. direct a significant number of visitors to an alternative route;
2. protect the surface from erosion while turf regenerates;
3. repair using fresh turf;
4. consolidate existing paths to contain erosion within present limits;
5. create alternative routes in better positions or gradients, restoring the original pathways with turf;
6. close all or part of the monument to public access temporarily or permanently.

If visitors are to be persuaded to use alternative routes then their co-operation needs to be harnessed. This could be achieved by a persuasive communication and would lessen the need to fence off areas. Fencing and signing are obtrusive methods for directing people in an open space site. The use of a leaflet has many advantages - it

can be made available at the main entrance point and ensure every visitor receives it; the leaflet can be easily changed if circumstances alter; it can carry information useful to the visitor to ensure that it is read and held on to; and it can 'sell' the commercial parts of the property. Experience at Studland, Dorset has shown that a leaflet with useful information such as a map, is kept by visitors and used to locate facilities such as car parks and walking routes (see Appendix 8).

In order to write a persuasive communication, the first step was to elicit visitors' salient beliefs about erosion and how it is caused, as the beliefs are the initial building blocks in the theory of reasoned action, and 'in order to influence behaviour we have to expose people to information which will produce changes in their beliefs', Ajzen (1980). However Ajzen does warn against assuming that changing a person's beliefs will always affect his behaviour. As there are a number of links that intervene in between beliefs and behaviour the assumption is made that:

> 'A change in beliefs will bring a change in attitude or subjective norm. It should be recalled, however, that attitudes are based on the total set of salient beliefs about performing a behavior. Changing one or more beliefs may not be sufficient to bring about change in the overall attitude...if neither the attitude nor the subjective norm changes, we cannot expect a change in behavior.' (Ajzen, 1980: 81).

Setting this in the context of Ajzen and Fishbein's Theory of Reasoned Action (1980), the behaviour targeted is 'walking on areas which are sensitive to erosion'. The salient beliefs towards this behaviour need to be discerned.

7.4 Methodology

The first step towards producing information in a persuasive communication which would act on visitors' salient beliefs and alter their behaviour towards walking on eroded areas at Avebury, was to research what beliefs and understanding visitors had about erosion and the causes of erosion, particularly the visitor's role in causing

erosion. It was not known whether visitors to Avebury knew what erosion actually was or what caused erosion. To investigate visitors' knowledge, awareness and beliefs about their own actions a questionnaire was used. A number of different methods were possible to gather this initial research information. The three methods which would provide the required information were interview, questionnaire and focus group. Interviewing would yield a rich source of information on a person's knowledge and beliefs about erosion but would limit the number of respondents due to the time it takes to conduct each separate interview. Focus groups again would give an in-depth view of a range of beliefs from a small group of people. A questionnaire was considered a more appropriate method because it allowed for a wider group of people to be involved in the research and gave the opportunity to ask the same question of each person. This enabled responses to be gathered from the different visitor groups identified at Avebury to see if they differed in their beliefs underlying the attitude about erosion. If there was a difference shown in any group the persuasive communication could be more clearly targeted towards that group.

7.4.1 Data collection

In 1999, additional questions were added to the standard visitor survey to elicit visitors' salient beliefs about erosion. This survey took place at the exit to the car park of visitors returning to their transport. The survey took place between July and September 1999. This covered the peak visitor season of July and August and the shoulder month with less visitors of September. Ten test questionnaires were carried out before the main survey to check the questions were understood and respondents were interpreting the questions in the way intended. As a result of the test, minor modifications were made in the final questionnaire. 962 respondents took part in the survey of which 380 were face-to-face interviews. The interviews followed the format of the questionnaire, taking between five and ten minutes. They were used to check the reliability of the questionnaire and that the questions were understood, as well as collecting the data from respondents. (See Appendix 9a for questionnaire). The remainder of the surveys were distributed by hand with a return paid mail envelope. The questionnaire contained 26 questions. Sixteen of the questions were visitor profile questions asking such items as where people had come from, where they had found the information to make the visit and how long their visit had lasted.

These questions were mainly closed questions with options given for answer. These questions enabled a profiling of the visitor and allowed a more specific analysis of possible differences in beliefs held by the different visitor groups. The additional ten questions focused on the beliefs and attitudes of respondents towards erosion. These consisted of a combination of open questions, closed questions, multiple-choice questions, a photograph of erosion and a map of the site. Respondents were picked randomly; every third visitor passing through the exit was approached.

A free leaflet was produced towards the end of 2001 containing the persuasive communication with a map and visitor information (Appendix 10). The persuasive communication was as follows:

> *Your footsteps count!*
>
> *You are one of 350,000 visitors to this unique site each year.*
>
> *The monument is fragile. Every footstep causes a bit of wear and tear on the steep henge banks. The National Trust repairs any erosion by resting the area then reseeding to allow grass to grow.*
>
> *You can help combat erosion and keep this special monument for future generations to enjoy by-*
>
> - *Not walking on paths marked with erosion control signs*
> - *Keeping out of fenced off areas*

This message was based on a similar one at Hadrian's Wall, in a code of respect 'Every Footstep Counts', which tries to persuade walkers to visit more robust sites rather than walk the Wall in winter (McGlade, 2001).

The effect of the leaflet, in particular its success in changing behaviour, was tested in 2001, 2002 and 2004 through questioning visitors using questionnaires. Only the results of 2002 and 2004 will be presented here as similar results were obtained in 2001 and 2002, increasing confidence in the reliability of the results. A number of different methods could be used to investigate the effectiveness of the leaflet; possibly one of the best methods for detecting change in behaviour is by direct observation of visitors' actions before and after reading the leaflet. However, there

were ethical considerations to this method; visitors would need to give permission for observation to take place which might well affect their subsequent behaviour. Also observation would have involved the complication of repeat visits to enable a before and after comparison. Instead an analysis of the difference in reported behaviour, gathered by questionnaire, between those visitors who had received the leaflet and those who had not was used to investigate the effectiveness of the persuasive communication.

In 2002, in March and April, six extra questions were added at the end of the main market research survey conducted at Avebury to test the effectiveness of the leaflet (Appendix 9b). The survey was carried out in the Great Barn where a pay-for-entry exhibition on Avebury was sited. 146 questionnaires were returned, mainly by self-completion but with some filled in by interviewers. Some of the questions on visitor effects from the 1999 survey were repeated. Respondents were asked: -

Have you walked around the Henge?
Has anything influenced where you walked?
Have you noticed any effects of visitors on the site today?
Is your visit likely to have any effect?
Have you looked at the welcome leaflet today?
Did any information in the leaflet change what you did at Avebury today?

The responses to the 2002 survey revealed some information about visitor behaviour but also raised further questions. To investigate some of the questions raised by the responses to the 2002 survey and to gather additional information on visitor behaviour, a further small scale survey was conducted in 2004, with a different questionnaire during March and April (questionnaire Appendix 9c). The questionnaire was pre-tested on National Trust staff and volunteers to check understanding of the questions. The questionnaire was carried out by interview using a single interviewer in the henge area itself in order to cover a wider sample of the visitors to Avebury. The questionnaire asked about other influences on visitors' behaviour as well as the leaflet, such as signs. It also covered attitudes towards changing behaviour with respect to erosion and normative influences. It contained 15

specific questions about the leaflet and visitors' behaviour and 12 general questions to gain a visitor profile. It was much shorter than the previous questionnaire used. 45 visitors were interviewed using this questionnaire. The leaflet was given out to visitors as they left the car park, some time later the same day interviews took place on the site in the henge area.

The areas the questionnaire was designed to investigate were: -

- What is the visitor's existing attitude and behaviour towards causing erosion on site?
- Does the persuasive communication in the welcome leaflet have any influence on visitors' attitudes and behaviour towards erosion?
- Do the signs on site have any influence on visitors' attitudes and behaviour towards erosion?
- Is there any normative influence from friends and family which influences visitors' attitude and behaviour towards erosion?

7.5 Results - 1999 questionnaire on beliefs

The 1999 questionnaire showed that in general, those that responded felt the site at Avebury was special. Some general belief questions were used as well as specific questions about erosion. In Question 10, the respondents were asked "*Is there anything about Avebury which makes it a particularly special place to you personally?*" followed by "*why is it special to you?*" This question was asked to find out how visitors felt about the site as this could affect the way they were prepared to behave. A person who believed the place was special could potentially have more respect for the site and be prepared to change their behaviour compared to a person who had no particular feelings about the site. The majority of visitors (84%) stated that there was something about Avebury which made it a special place. The most popular reason given by people for visiting Avebury was to walk among the stones (86% of visitors questioned, n=962) and 49% gave a spiritual/atmosphere response to the question asking why Avebury was special to them, Table 7.1. An answer of atmosphere and spirituality to the question '*why is Avebury special to you?*' is an

unusual answer for a countryside site, perhaps indicating an extra dimension of fragility, not just the physical surroundings which were important, and an extra dimension of care which could be needed to preserve the site. The answer of exceptional scenery also showed a belief in the importance of the site. From these responses I would expect that people who believed the place was special would be more likely to want to take measures to help protect the site for the future. Indeed if a person was visiting believing that the site has exceptional scenery they would be unlikely to want that exceptional scenery to be changed or damaged in any way.

Table 7.1 Categories of response to the question Why is it (Avebury) special to you? (n= 120)

Category of response	%*
A spiritual place/the atmosphere/mysterious	49%
Exceptional scenery	26%
An interesting place to walk	25%
Good for children	15%
Partner/friend enjoys coming	12%
Interesting day out	12%
Visiting museum	12%
Visiting restaurant	10%

* more than one response was possible

The majority of respondents (83%) did not notice visitors as having any effect on the site and the majority (64%) did not believe their own visit had any effect. Of the minority (23%) that recognised their visit might have an effect on the site only 3.9% of the overall sample felt that their visit might cause wear and tear. The visitor types least aware of any possible wear and tear or erosion visitors might cause were the day-trippers and the casual non-specific visitors, Table 7.2.

Table 7.2 To show respondents that had seen erosion as an effect by visitor group (n=962)

Sample	Visitor type	Erosion noted
16%	Spiritually motivated	19
19%	Archaeol./history interest	18
17%	Local day trippers	16
18%	Environmental interest	16
15%	Day trippers	4
12%	Casual /non specific	2

However, there was a good understanding of erosion by respondents, 57% recognised the photo in the questionnaire as showing erosion, and the measures to control erosion were well understood. Three of the suggestions on erosion control respondents gave involved giving people information about erosion, Table 7.3.

Table 7.3 Categories of response to 'What do you think could be done to solve the problem' (of erosion) (n=122)

Category	%
Fencing off and reseeding (temporary)	36%
Indicate problem and redirect people	31%
Leave it as it is	12%
Giving people information on erosion early on in visit	11%
Provide a permanent warden to inform and direct	10%

The majority of respondents accepted the actions that were needed to help combat erosion such as 'not walking on areas fenced off to allow grass to grow' (65%) of respondents, but did not accept restrictions such as closing parts of the monument, Table 7.4.

Table 7.4 Responses to the question:-Which of the following management actions would you accept to help the preservation of Avebury? (n= 122)

Response	Acceptable %	Not acceptable %	Don't know %
Not walking on areas fenced off to allow grass to grow	65	21	14
New routes for paths to avoid worn areas	64	15	21
Paths closed to allow worn areas to recover	49	26	25
Charge a car park fee which is spent on repair work	46	37	17
Not walking on areas with erosion control signs	43	22	35
Spend more time and money on repairs	26	51	23
Closure of parts of the monument in winter	21	57	22
Not walking on top of hedge banks	18	49	33
Only walking on dedicated paths	14	58	28
Closure of parts of the monument all year	9	67	24

Care needs to be taken in extrapolating results from a questionnaire to the main

visitor population because there is always some bias in a sampling technique. The use of a questionnaire will probably have excluded all foreign language visitors and any visitor who cannot read or write – although some of these may have been picked up in the interviews. Self-completion questionnaires will only be completed by those motivated to fill them in. This may under-represent some visitor groups such as the casual visitor. However, bearing in mind that there are possible biases in sampling visitors in this way, the results found that the majority of visitors questioned (64%) were unaware of their impact on the site. This supports the findings of Roggenbuck (in Manfredo, 1992) that the most common visitor response to environmental deterioration in recreation settings is a failure to even notice the deterioration.

The 1999 questionnaire results indicated that any persuasive communication needed to be constructed to act on the belief that visitors do not have an effect on the site and change this belief to one where visitors do believe their visiting has an impact. The leaflet needed to be particularly targeted at the day-tripper and casual non-specific visitor who showed least awareness of erosion. The majority of respondents already appeared to have a positive attitude to the actions of not walking on areas with erosion control signs and not walking on areas fenced off to allow grass to grow. So it was hoped that a persuasive communication which contained information which changed the awareness of visitors to their own impact on the site when visiting, and gave as possible actions not walking on paths with erosion control signs and keeping out of fenced off areas, would have a positive effect.

7.6 Effect of persuasive message in leaflet, 2002 and 2004 Visitor survey results

The free leaflet was available from an information van in the car park during the main visitor season in 2002 and 2004. Questionnaires were carried out in 2002 and 2004 to investigate the effectiveness of the persuasive communication in the free leaflet. The results of the 2002 and 2004 surveys have been summarised into a table alongside the 1999 results to enable broad comparisons to be made, Table 7.5.

Table 7.5 Summary of questionnaire results

Year	1999	2002	2004
Purpose of questionnaire	Beliefs towards erosion	Effect of leaflet on behaviour	Effect of leaflet and signs on behaviour
Number of respondents	122	146	45
Time of year of survey	July - September	March - April	March - April
% First time visitors	80%	36%	33%
% NT members	36%	68%	31%
Survey site	Car park exit	Great Barn	Henge - beside stones
Survey method	Interview and self-completion	Self-completion	Interview
No. of relevant questions in questionnaire	10/26	6/40	15/26
Main reason for visit	Walk among the stones (86%)	Interest in history/archaeology (60%)	Short walk (47%)
% recording erosion as a visitor effect	8%	33%	24%
% recording their own visit causes erosion	3.9%	31%	22%
Evidence of behaviour change		None but 14% used leaflet for information	35% avoided eroded areas

The questionnaires were carried out in different places on the site and as a result had a different range of respondents. In 2002 the questionnaire carried out in the Great Barn, where the exhibition 'Avebury, 6000 years of mystery' was staged, had a higher proportion of National Trust members (68%) and visitors interested in history and archaeology responding compared to 2004 where the respondents were more general interest visitors out for a short walk and with a lower percentage of National Trust members (31%).

More people in both 2002 and 2004 showed awareness of their visit causing erosion on site than in 1999. This could be due to erosion and control measures being more visible on site in 2002 and 2004, due to the time of year the surveys took place. In March and April areas were roped off to allow grass to recover and signed to inform

visitors of the work taking place. Other possibilities are that the free leaflet increased awareness or visitors were generally more aware. To test whether the leaflet had any effect on this result the responses to the question *'Do you think your visit is likely to have any effect on the site?'* were compared with whether or not they had received a leaflet, Table 7.6.

Table 7.6 To compare whether respondents believed their visit caused erosion with looking at the welcome leaflet in 2002

	Those who had welcome leaflet	Those who did not have welcome leaflet	Total (n=146)
Mentioned their visit caused erosion	18 (24%)	27 (39%)	45
Mentioned other effects of their visit	10 (13%)	3 (4%)	13
Did not give a response	48 (63%)	40 (56%)	88
Total	76	70	146

A higher percentage of those respondents who did not look at a welcome leaflet believed their visit could cause erosion on the site. For the leaflet to show an influence on beliefs I would expect a higher percentage of respondents who *had* seen the leaflet to be aware of erosion. In this case the data shows the leaflet is not showing a significant influence on visitors' beliefs, possibly because the awareness is already high amongst respondents, or possibly because there is some other influence on visitors' beliefs such as erosion control signs on the site. If the figures for mentioning and not mentioning erosion are compared with whether or not the respondent had looked at the welcome leaflet using chi-squared, the distribution is found to be significant at 0.025 level. Chi-squared = 5.5 with 1 degree of freedom. This shows that there is a significant difference between believing your visit caused erosion and whether or not you had looked at the welcome leaflet. It is possible that there are other differences between the two groups (those people who had the welcome leaflet and those that did not) which are not showing up from the questionnaire and have affected their response to this question. For instance, the

group not looking at the welcome leaflet may have been influenced by erosion signs on site. This needs further investigation.

In 2004 a different result was obtained when comparing people who believed their visit caused erosion and whether or not they had received a welcome leaflet. Table 7.7.

Table 7.7 To compare whether respondents believed their visit could cause erosion and looking at the welcome leaflet in 2004

	Those who had welcome leaflet	Those who did not have welcome leaflet	Total
Mentioned their visit caused erosion	9 (47%)	1 (4%)	10
Mentioned other effects of their visit	7 (37%)	4 (15%)	11
Did not give a response	3 (16%)	21 (81%)	24
Total	19	26	45

Table 7.7 shows that in 2004, more people who had a welcome leaflet mentioned erosion as an effect of their visit than those who did not have a leaflet. The leaflet is showing more effect in this small scale survey. This difference in response between the two surveys could be due to the different types of visitor responding to the surveys. In 2002 the respondents were mainly interested archaeologists and National Trust members, whereas in 2004 there were more general day out visitors responding to the survey. The day out visitor was shown to be less aware of erosion in the 1999 questionnaire on beliefs and the leaflet may therefore have had more effect on their beliefs.

To measure whether the persuasive communication had any effect on visitors' actions, respondents to the questionnaire were asked whether anything influenced where they walked. Also, whether they had looked at the welcome leaflet and whether any information in the leaflet changed what they did at Avebury. In 2002, 75 (51%) of people stated that they had looked at the welcome leaflet. Of those 75 respondents, 20 (27 %) said that information in the leaflet changed what they did and 55 (73%) said it did not. Most of the changes related to seeing the new exhibition in

the Great Barn – highlighted in the leaflet, 11 respondents (55%). One person mentioned using the map of the Henge; four others mentioned routing, paths and understanding the area better. Not one respondent explicitly mentioned anything related to the insert box with the persuasive communication on erosion in it, which is perhaps rather surprising. The questionnaire results indicate that 20 people out 75 who received the leaflet attended to the inside pages and used information available on these pages such as the map, but no respondents make any mention of referring to any text. It is possible that people were looking at the leaflet and making use of the information, particularly the map, but also the erosion information but not explicitly mentioning it in the questionnaire. The relevant questions about the leaflet and visitor behaviour were all at the end of a rather lengthy questionnaire (questions 38 to 46), and it is possible that visitors were not motivated to spend time on these questions causing the lack of response. Although there is no reference to the text on erosion in the leaflet in the questionnaire answers, visitors are showing an increased awareness of erosion and of their own contribution to erosion compared to 1999 (24% of those who received the leaflet and 39% of those who did not). Other aspects of the visit which could contribute to awareness on erosion are the physical repair taking place on the site with roping off and signs.

In contrast, in 2004 in response to the question testing the effectiveness of the welcome leaflet, 19 (42%) respondents had looked at the welcome leaflet and 19 (42%) respondents said 'yes', that some information in the leaflet had influenced what they did at Avebury that day, Table 7.8

Table 7.8 Information gained from the welcome leaflet

Information which influenced visitors	Count (n=19)*
Avoided erosion	16 (84%)
Noted where to visit	13 (68%)
Visited exhibition/church	5 (26%)
Noted public transport	2 (10%)
Parked in car park	1 (5%)

*multiple responses possible

16 out 19 respondents mentioned avoiding worn areas or understanding their effect in terms of causing erosion on the site as an influence from the leaflet. 13 respondents noted where to visit from the leaflet, with a further five visiting specific places as a result of seeing the leaflet. These results show that visitors were attending to the leaflet and using the information in it, including the persuasive communication. This difference in response from 2002 could be due to there being more 'day out' visitors in the 2004 visitor survey respondents and these respondents being more responsive to the information on erosion, as they generally seemed to have less initial awareness of erosion. The leaflet seems to have been better used by the 2004 respondents with more information being noted as of use to the visitor e.g. public transport information and noting where to visit.

The 2004 survey probed a number of areas which the 2002 survey was unable to do. These included intentions on the site, attitudes towards changing behaviour, normative influences and effect of signs on site. To find out visitors' intentions on the site they were asked a series of questions on how likely or unlikely they were to carry out a series of stated actions Table 7.9.

Table7.9 How likely are you to have carried out any of the following actions during your visit?(n=44)

	Very Likely	Likely	Neither	Unlikely	Very Unlikely
Use a different route to avoid a worn area	21	8	0	11	4
Avoid a path closed to allow a worn area to recover	20	17	2	5	0
Only walk on defined paths to get to the top of the henge	1	6	0	25	12
Walk up grassy slopes to get to the top of henge banks	33	11	0	0	0
Not walk on top of the henge banks	1	3	0	23	17
Not walk on areas with erosion control signs	28	16	0	0	0
Give donation with the car park fee	1	9	7	17	10

The results in Table 7.9 show an interesting range of actions. All respondents are likely or very likely not to walk on areas with erosion control signs, but not all respondents would use a different route to avoid a worn area, 15 respondents (34%) state they are unlikely or very unlikely to do this. The majority of respondents are likely or very likely to avoid a path closed to allow a worn area to recover (seven stated neither or unlikely). Most respondents were likely to walk on top of the henge banks. The most worrying of the responses is the number who are unlikely to stick to defined paths to get to the top of the henge and that all the respondents are likely or very likely to walk up grassy slopes to get to the top of the henge banks as these are both actions which cause erosion. This suggests that respondents were not aware of which actions might cause erosion and needed more information to guide them.

When respondents were asked whether they were likely to change their behaviour to

help prevent erosion, 58% of respondents stated that they were likely or very likely to change their behaviour to help prevent erosion which shows a positive attitude amongst more than half the respondents, Table 7.10. However, this leaves quite a large proportion who may need to be persuaded or who indeed may need a stronger action than persuasion.

Table 7.10 Likelihood of changing behaviour to help prevent erosion

Change behaviour to help prevent erosion	Count (n=45) (%)
Very Likely	14 (31%)
Likely	12 (27%)
Neither	8 (18%)
Unlikely	7 (15%)
Very Unlikely	3 (7%)
No response	1

When the respondent's intention to change behaviour is compared with whether or not they have read the leaflet a definite trend is seen, Table 7.11. Respondents are more likely to say they will change their behaviour towards erosion if they have read the leaflet. Only two people who had looked at the leaflet said they were unlikely or very unlikely to change their behaviour. However although these results indicate a trend, these numbers are very small to draw definite conclusions from and really need more research to confirm.

Table 7.11 To show the link between changing behaviour and looking at the welcome leaflet (n=45)

Likelihood of changing behaviour	Looked at welcome leaflet	Not looked at welcome leaflet
Very Likely	10	4
Likely	5	7
Neither	1	7
Unlikely	1	6
Very unlikely	1	2
No response	1	0

Respondents were asked whether any signs on site had an influence on the way they behaved. This was to measure the effects of other influences on visitors' behaviour apart from the leaflet. 18 respondents answered yes to this question with 27 giving a negative answer. Sixteen respondents stated that the erosion and newly seeded area

signs influenced what they did on site compared to 10 who used direction signs, Table 7.12. Six respondents were influenced by signs but not the leaflet.

Table 7.12 What signs and how did it affect what you did?

Signs which influenced activities	Count* (n=18)
Keep off seeded areas and erosion signs	16
Direction signs	10
Information boards	4

*multiple responses possible

This result confirms a question raised by the previous survey which was whether there were other influences on visitors apart from the welcome leaflet. 18 out of 45 visitors (40%) were influenced by signs on site, including 16 who were influenced by erosion control signs.

7.6.1 Subjective norm influences

The Theory of Reasoned Action proposes that one's intention to perform a behaviour is a factor of the attitude towards the behaviour and one's perception of what important others think about performing the behaviour in question (the subjective norm). In the previous surveys at Chelsea Physic Garden and Studland the subjective norm part of the model was not investigated as it was not felt to be as influential on the behaviour being researched. In this situation, avoiding eroded areas, the influence of the subjective norm was thought to possibly have an effect because it was a very visible behaviour, people in a group can see where each individual of the group is walking. To investigate the subjective norm two questions were used in the questionnaire, one asking the view of the respondent on what they thought their friends and family felt about activity which caused erosion at Avebury, Table 7.13, and a second question on the motivation to comply with friends and family's views, Table 7.14.

Table 7.13 Friends and family feel that causing erosion at Avebury should be avoided

	Count(n=45)
Agree strongly	6
Agree	15
Neither	12
Disagree	10
Disagree strongly	2

Table 7.14 I am influenced by friends and family's views

	Count(n=45)
Agree strongly	5
Agree	21
Neither	10
Disagree	7
Disagree strongly	2

More respondents agreed 21 (47%) that friends and family feel that activity that causes erosion at Avebury should be avoided if possible than disagreed 12 (27%). Also more respondents agreed 26 (58%) that they were influenced by friends and family's views than disagreed 9 (20%). Within this group of respondents the influence of friends and family was reasonably strong for more than half the respondents. The persuasive communication did not target the beliefs underlying the subjective norm in this case but this result indicated that it would be an area worth investigating further.

7.7 Conclusions-Success of the leaflet as a persuasive communication

The initial survey in 1999 gave information on visitors' beliefs about their impact on the site and showed that 23% of visitors questioned recognised that they had some adverse impacts on the site. The awareness and beliefs of visitors about their own activities causing erosion as an impact was low, only 3.9% mentioned that they might cause wear and tear. This led to the persuasive message being used in the welcome leaflet which highlighted the impact people caused –'your footsteps count' based on a solution to a similar issue at Hadrian's Wall.

Two surveys were then carried out, one using mainly self-completion questionnaires

in the Great Barn (2002), and one carried out on site by an interviewer (2004). In the first survey (2002), 24% of visitors (18 respondents) who looked at the leaflet stated that their own visit could cause erosion. 39% of visitors (27 respondents) who did not have the leaflet (the comparison group) mentioned that their visit could cause erosion. There was a high awareness of visitors' contribution to erosion among the respondents which did not increase in the group who received the leaflet, possibly because the awareness was high already. There were a much higher number of respondents in 2002 believing that visitors caused erosion than in 1999. In 2004, 22% of respondents thought their visit could cause erosion. But there was much more evidence of information gained from the welcome leaflet and signs on site which had an influence on visitors' activities. 16 respondents (35% of all respondents) were influenced by information on erosion in the leaflet. Similarly 16 respondents (35%) were influenced by signs on site.

There are a number of possible reasons for the difference in responses from the two surveys. In the survey in 2004 the leaflet showed more effect. The groups interviewed appear to have a different range of people. The groups filling in questionnaires in the Great Barn included more National Trust members and many more people visiting with an interest in history and archaeology. The groups interviewed on site in 2004 had less National Trust members and more visitors with a general interest in visiting the site – more of the day out visitor. The initial work on beliefs in 1999 showed that the day out visitor had less awareness of erosion compared to the visitor interested in archaeology and history and would therefore gain more from the leaflet. The survey in 2004 showed that the signs on site did have an influence on visitors' behaviour. It is possible that visible effects of erosion control on site such as ropes and signs used to explain the ropes were having an effect on visitors in 2002, which accounts for the high level of awareness of erosion in those visitors who did not receive the leaflet. However, no questions on the questionnaire targeted this area in 2002. Care needs to be taken in interpreting the 2004 survey results as the total survey number is only 45. This could be a small enough proportion of the visitors to contain some anomalies.

There are a number of possible reasons for the difference in results between the 1999 survey and 2002. The higher number of respondents (in 2002 and 2004) believing

that both visitors and their own actions are contributors to erosion may be due to the time of year of the survey - when erosion control was visibly taking place on the site. In the summer months the paths are dry and they show as white streaks against the grass but they do not give the impression that there is a problem with erosion. On the whole, research has shown that visitors have very little awareness of erosion (Roggenbuck, 1992). However, in the winter months, in wet weather, the paths are wet and muddy and erosion is much more visible. Also in winter, the main work on erosion control takes place on site and there are areas roped off with signs explaining the work taking place, (see example in Appendix 12). The 2004 survey has shown that signs are an important source of information attended to by visitors. In 2002, the on-site signs might have had more effect than information included in the leaflet, possibly because the leaflet was less readily available. This needs further research to confirm.

Other possibilities are that the persuasive communication on the leaflet is not obvious enough and too small. The box takes up approximately an eighth of one side of the leaflet in the bottom right–hand corner in 10pt type, with a map of the site taking up the rest of the space. According to Webb (1994) in relation to advertisements, attention getting power increases with increasing size, but with decreasing returns. To double an advertisement's attracting power the size has to be quadrupled as attention increases in proportion to the square root of the advertisement's area. Also the map may have distracted attention from the persuasive communication. Bitgood & Cleghorn (1994) found recall of visual elements of displays was far superior to semantic (label content). Another possibility is that the action suggested on the leaflet may not be clear enough. A clearer action would be to suggest to visitors that they keep to paths, but the problem with Avebury henge is the only defined paths are on the top of henge banks with none in the henge itself. The management do not want to use clearly defined paths around the stones as the visitor load can be spread over a wider area when not using paths so the message to visitors had to be an instruction to not walk on paths with erosion control signs.

Other possibilities to explain differences in the findings between the two years could be attributed to the research method. There were difficulties in making sure visitors received the welcome leaflet due to the open nature of the site. The main exit from

the car park was used to distribute leaflets but it is possible that people filling in the questionnaire in the Great Barn were not sure which leaflet the questions were referring to. The majority of the questionnaires completed in the Great Barn were self-completion so respondents were not able to clarify they were referring to the correct leaflet. Also the questions in 2002 did not probe the question 'Has anything influenced where you walked today?' missing out on possibly valuable data.

In measuring the effect of the persuasive communication in changing attitudes and behaviour towards erosion, the 2002 survey has not shown the leaflet having a significant effect, possibly due to problems with the questionnaire and getting leaflets to visitors. However the 2004 survey has shown an effect although it is based on a small number of surveys. More people who had read the welcome leaflet said they were likely to change their behaviour to help prevent erosion (15 who had read the leaflet compared to 11 who had not) and more people who had not read the leaflet were unlikely to change their behaviour to help prevent erosion (8 who had *not* read the leaflet compared to 2 who had read the leaflet). 16 out of 19 people who had read the leaflet said that the leaflet had influenced them and they would avoid eroded areas.

The welcome leaflet was certainly of use to visitors in both 2002 and 2004 and it shows some effect of directing where people go from the 27% who stated that the leaflet changed what they did in 2002. The most obvious effect was that people visited the Great Barn exhibition from seeing it on the leaflet in 2002.

McGlade, working at Hadrian's Wall, used a leaflet 'Every Footstep Counts' to encourage walkers in the winter to use circular walks and visit the more robust pay-to-enter sites rather than walking the fragile soils of the Wall. The leaflet contained a code of respect which included:

> 'Start and finish your walk along the Wall at different places, or follow a circular route. This way there will be half as much wear on the path next to the Wall.
>
> During the wet winter months the ground is waterlogged and this is

> when the risk of damage to the monument is greatest. Instead you could walk one of the alternative trails that are being developed close to the Wall.
>
> Never climb up or walk on top of Hadrian's Wall.' (McGlade, 2001b)

This code of respect is also used on souvenir passport cards which over half the trail walkers use. He reports (McGlade pers comm., 2004) that a survey of 80 respondents found 85% of interviewees knew about the code of respect. No data was available to measure whether the code of respect had changed the behaviour of walkers and it was felt that there was still a problem in dissuading visitors from walking the Wall in winter.

In trying to influence how people behave there are a number of behavioural control devices available ranging from direct forms of influence to indirect forms. Direct forms include coercive acts such as police enforcement and closure of access, while indirect forms include more subtle forms of influence such as education of the users, persuasive communication and site design. The responses from initial interviews of visitors to Avebury in 1999 showed that closure of access was not a favoured option among respondents and might therefore be counter productive if used, causing bad feeling towards the National Trust and possibly resulting in a loss of support. Given the quest of recreation management to facilitate freedom of choice, the more indirect forms of control are preferable (Lucas, 1982, in Manfredo, 1992). One of the most effective means of behavioural control is simply to provide visitors with information about the consequences of their behaviour. Research has repeatedly shown that many of the depreciative acts transpiring in recreation areas are committed by people unaware of their impacts (Christensen and Clark, 1983, in Manfredo, 1992).

This research study has shown that it is possible to influence visitors' behaviour towards erosion but a leaflet is not successful with all visitor groups. Signs on site, although they can be intrusive, seem to have more impact than a leaflet in certain cases. Signs have an immediate impact at the point where it is needed; a leaflet in contrast may be read in one situation when the information is not directly relevant then may be forgotten at the relevant point where erosion control is taking place. To

be effective in persuasion on a site such as Avebury more than one communication channel is needed. The signs on site give an immediate explanation and persuasion to use a different route and the leaflet enables a fuller account of the work taking place and the reasons for the work. Effective communication initiatives should use multiple communication channels or media to be successful, which indicates that using both a leaflet and signs will have the best effect in changing behaviour towards erosion.

Chapter 8 Conclusions and Implications

8.1 Introduction

This research aimed to answer the following questions:-

1. Is it possible to successfully change attitudes and behaviour by using a persuasive communication in a leisure setting?
2. Is it only possible to influence immediate behaviours or can there be a wider and more long lasting influence?
3. Is the Ajzen and Fishbein 'Theory of Reasoned Action' a valid model to use?
4. What factors contribute to successful behaviour change?
5. Are some behaviours easier to influence than others in leisure settings?

Three separate studies were undertaken in different leisure settings using persuasive communications to attempt to influence the behaviour of visitors. The use of three studies has enabled a comparison to be made and more general conclusions to be drawn out on the use of persuasive communications in recreational settings. The theoretical basis for the research was the Ajzen and Fishbein (1980) 'Theory of Reasoned Action' model (TRA). By using the TRA as a model this research has tested the effectiveness of three different persuasive communications in three contrasting settings and drawn conclusions on the use of the model and persuasive communications to encourage action. The stimulus to carrying out this work was the belief that it is not enough just to increase public awareness of conservation issues, action must follow if we are to conserve the Earth and, for instance, reduce the amount of waste we throw away. Many communications produced by museums, site managers and conservation organisations concentrate on increasing awareness when concentrating on behaviour change by using a persuasive communication would be more profitable.

> 'Persuasion is a central feature of every sphere of human communication. Persuasion is found wherever you find people communicating' (Gass & Seiter, 2003:4).

Museums, visitor centres, botanic gardens and zoos are in a particularly good position to rethink the role, and improve the impact, of their displays and exhibitions by planning for attitude and behaviour change and including persuasive communications in the display text. Also, this study of persuasion has important implications for countryside site management. Persuasion is an important management tool in a leisure setting. Often a recreation manager or warden needs co-operation from visitors. Avoiding the use of coercion and regulation on people who are taking part in recreational visits is preferable, as a list of rules can interfere with visitors' enjoyment.

> 'The more land managers know about the factors influencing a decision to perform or not perform a given behavior ...or the factors underlying public support or opposition to policies or issues, the more likely their ability to develop effective messages or other types of interventions to influence these decisions or positions. Accordingly we need to examine theoretical approaches that increase our understanding of why a person does or does not engage in a given action.' (Fishbein and Manfredo in Manfredo, 1992: 29).

This research contributes to developing our understanding of the type of messages which are effective and the actions a visitor can be persuaded to undertake in a leisure setting from a comparison of three different sites and the persuasion of three contrasting actions at these sites. The results of the three studies show that persuasion is an effective strategy for site mangers to use in some, but not all, circumstances.

8.2 Importance of the Theory of Reasoned Action

The three research studies undertook to investigate the role of a persuasive communication in changing behaviour in three different settings using the Ajzen and Fishbein Theory of Reasoned Action to guide the interventions. The Theory of Reasoned Action rests on the assumption that humans are reasoning animals who

systematically utilize or process the information available to them (Ajzen and Fishbein, 1980). In each of the studies the behaviour investigated was under volitional control, rather than a spontaneous action and the change in behaviour needed some reasoned action making the studies suitable investigations using the model. The Ajzen and Fishbein model provided a conceptual framework to guide the interventions in this research. In particular it enabled the persuasive communications to target the appropriate beliefs in the sequence of events which leads to a change in behaviour in an individual. An area of the model which was not investigated in this research but which would merit further attention is that of the influence of the subjective norm. Ajzen (1988) found that in eight out of ten studies he reviewed, attitudinal contributions exceeded normative contributions. Steen et al (1998) found 'that attitude was more important to the prediction of intention to minimize sun exposure than was social norm'. O'Keefe (2002) suggests that 'in the absence of information to the contrary, one should probably assume that the attitude toward the behaviour will be a more powerful influence on intention than will subjective norm'. Taking these findings into account the decision was made to concentrate on the part of the model concerning attitude towards the behaviour and the beliefs underlying these attitudes. This research has developed our understanding of persuasive communications and shown that it is possible to change behaviour by persuasion in a leisure setting but it depends on the behaviour, the audience and the persuasive communication.

8.3 Summary of research results

8.3.1Chelsea Physic Garden

The study at Chelsea Physic Garden showed that visitors to a Botanic Garden setting could have their attitudes and behaviours influenced towards nature conservation in their own garden by using a persuasive communication in an exhibit. Beliefs regarding wildlife-friendly practices in visitors' home gardens were targeted in the persuasive communication in the exhibition. Short term the awareness about the importance of plants was heightened by the exhibit and more concern was shown for plants. This was apparent from the question in the questionnaire on 'the reasons why

plants should be conserved'. There was a higher percentage of ethical comments from those visitors questioned who had seen the exhibit compared to those who had not (from 7% to 28%), indicating an increase in concern in those visitors who had seen the exhibit. The majority of visitors questioned had gardens, and attitudes towards environmentally-friendly behaviour in their own gardens were already strongly positive (84% of the pre-exhibit group and 62% of the post-exhibit group grew garden plants).

8.3.1.1Influence on beliefs

In order to influence behaviour the Ajzen and Fishbein model suggests that the beliefs about the behaviour should be changed. Different beliefs were targeted in each of the three studies. The exhibit at Chelsea Physic Garden aimed to do this through the persuasive communication used. The beliefs that were targeted in the Chelsea Physic Garden exhibit were the beliefs that our gardens are important habitats for wildlife. The effect of a display on the answers to a question specifically directed at beliefs 'What might you be able to do to help conserve plants and the environment?' showed more people suggested effective action, either in gardens or in general, after seeing the display than before (an increase from 38% to 49% for effective gardening actions). The research has shown that the persuasive communication in the exhibit was able to act on beliefs about conservation to change them. This is an important finding as it shows that beliefs can be influenced by information through a persuasive communication. The wider implications of this finding are that museums and visitor centres using displays could be much more influential in influencing visitors' behaviour through influencing beliefs towards the behaviour.

Recent work by the Museums, Libraries and Archives Council has brought this issue more to the fore. In the 'Inspiring learning for all toolkit', (M.L.A. www.inspiringlearningforall.gov.uk, 2004) change in behaviour has been recognised as an area of learning alongside 'increase in knowledge and understanding, skills, attitudes and values, enjoyment inspiration and creativity, and activity and progression'. This toolkit may encourage museums to set learning objectives for exhibitions which encompass behaviour change as well as the more usual knowledge

and understanding objectives.

One of the findings from the research at Chelsea Physic Garden was that although visitors were already interested in gardens and plants, 75% of the pre group and 61 % of the post group had a garden and grew native plants, they lacked the information to know what to do. The persuasive communication provided the visitors with information they needed to be able to garden in a wildlife-friendly way as well as acting on beliefs. However, the work of the persuasive communication was made easier by many of the visitors already being interested in gardening but lacking the information to know what to do to enhance the conservation potential of their gardens. A recent MORI poll (2003) of 1,885 adults in Britain backs up this result, finding that gardeners need more information to encourage wildlife in their gardens.

> 'Two in five gardeners (38%) say they would do more to encourage wildlife if they had more information, according to a new survey from the MORI Social Research Institute. The report published on behalf of the Royal Horticultural Society - shows more than two-thirds of those with a garden (70%) think people should consider wildlife when maintaining their garden. However, only half of gardeners (50%) believe they are currently doing all they can to encourage wildlife.' (www.mori.com/polls, 2003)

Although there may have been a rise in the interest in wildlife and gardening since 1992, this MORI poll shows that many gardeners are still lacking the information required to make changes. Gardeners not only needed to be persuaded to make changes but also required the information in the persuasive communication to be able to make the changes. This study shows that information needed to make the change needs to be included in a persuasive communication as well as the inducement or persuasion.

Further evidence of the topicality of wildlife gardening comes from a recent 'Gardeners' World' television programme (6th August 2004), which ran a one hour special described as follows: 'In which Chris Beardshaw uncovers treasured flowers

on the edge of extinction'. This was supported by an article in the BBC Gardeners' World magazine, 'Go wild in the garden. Packed with practical ideas for attracting wildlife, our guide will help you transform your garden to a haven' (Pasco (Ed), 2004).

8.3.1.2 Importance of follow-up

The study at Chelsea Physic Garden included a follow-up questionnaire where visitors were questioned some time after they had visited the garden (between one and six months) to record the long-term effect of visiting the exhibit and particularly to research any actual behaviour change as a result of seeing the exhibit and visiting the garden. The results of this questionnaire showed that visitors reported that they remembered aspects about the plants in the garden and the atmosphere of the garden most frequently. More than a third of those followed-up accurately remembered suggestions for enhancing conservation in their own gardens, particularly the use of growing native plants and allowing 'wild' areas, and more than a third (35%) had changed or intended to make changes in the way they gardened as a result of seeing the display and/or looking at the leaflet '*Wake up to what you can do for the environment*' (Dept. of Environment, 1990). This research at Chelsea Physic Garden has shown that the use of a follow-up when trying to change behaviour adds greatly to the information collected and understanding of the success of the intervention. It also shows that the behaviour change at Chelsea Physic Garden was enduring.

8.3.1.3 Stability of behaviour change

Behaviour change through persuasion can be stable and lasting although there is limited research to support this finding. O'Keefe (2002) says that persuasive effects tend to dissipate over time but that those achieved under conditions of high elaboration i.e. where persuasion results from thinking about the issues or arguments under consideration, are more enduring than those achieved under low elaboration i.e. where persuasion results from associating the advocated position with other positive things rather than thinking about the issue.

> 'Old habits and attitudes can return, competing persuasive messages can be received, and hence the impact of a given persuasive effort is

> likely to diminish over time... The Elaboration Likelihood Model suggests that persuasion achieved under conditions of high elaboration (central route processes) is more likely to be enduring than that obtained under conditions of low elaboration (peripheral route processing).' O'Keefe (2002: 258).

The research at Chelsea Physic Garden showed that the information in the persuasive communication and subsequent behaviour change was enduring and was apparent three-six months after the visit, as shown by the follow-up survey.

8.3.2 Studland

A study at Studland beach was then undertaken to investigate the wider applicability of the Theory of Reasoned Action. Visitors to Studland beach were influenced by a persuasive communication in a free leaflet to take their litter home rather than put it in a bin on the beach with some success but not in significant numbers. The visitors showed strong positive attitudes to taking their litter home, (92% either agreed strongly or agreed that they should take their rubbish home and recycle it) but less people had positive intentions for taking their litter home; 43% of those who had looked at the leaflet intended to take their litter home compared to 35% who had not looked at the leaflet. The leaflet also raised awareness of the importance of the wildlife in the area (52% of comments on the question 'learnt something new') and the cost of litter disposal (7% of comments on the question 'learnt something new').

The leaflet in the Studland study was designed to influence the beliefs about disposing of litter by introducing a persuasive communication with the novel belief highlighting the cost of litter removal, and better use for the money being spent in looking after the wildlife in the area. Visitors had very positive attitudes towards taking their litter home but their intentions were not so positive. As intentions are a good indication of behaviour, this indicates that the resulting behaviour should be that just under half the people who read the leaflet (43%) would take their litter home.

'Intentions are thus closely linked to volitional actions and can predict them with a high degree of accuracy. This is not to say, however, that a measure of intention will always correlate strongly with the corresponding behavior. Clearly intentions can change over time; the longer the time interval, the greater the likelihood that unforeseen events will produce changes in intentions.' (Ajzen, 1988: 115).

Intentions to take litter home were stronger in those that had the leaflet but not significantly so (43% who had the leaflet compared to 35% did not). In order to achieve a behaviour change it is necessary to change a sufficient number of beliefs, it is possible that the leaflet may have changed a few of the beliefs regarding taking litter home but not sufficient to produce a significant change in the behaviour. The leaflet might have been made more effective with further arguments on the environmental effects of litter and the importance of recycling acting on more beliefs. Further research investigating the underlying beliefs and attitudes towards the behaviour regarding putting litter in the bin, as against taking it home, and the barriers to the action of taking litter home is needed.

8.3.2.1 Limiting Factors

A number of factors may have influenced the leaflet's lack of success. The limited space in a leaflet restricted the content of the persuasive communication. The content is all-important.

> 'Information is the essence of the persuasion process. Receivers are exposed to a persuasive communication in the hope that they will be influenced by the information it contains' (Ajzen and Fishbein, 1980: 221).

It is possible that the inducement part of the persuasion was not persuasive enough to encourage people to take part in what for many would be an action requiring a bit of effort. (The inducement was 'to save the National Trust money which could be used on wildlife instead'). The audience in this study was a wider audience than the visitors to Chelsea Physic Garden, the people questioned were visiting Studland

beach because it was a nice beach, to sunbathe, swim, walk and picnic but not

The constraints to taking litter home and recycling it at Studland could be that the majority of visitors were staying in holiday accommodation and did not feel able to take litter back. Also they may have carried a lot of equipment from their cars to the beach and did not feel inclined to carry anything extra back at the end of the day. Further research would be needed to find out the nature of the constraint and provide effective action to overcome it.

necessarily for conservation or wildlife reasons. This research has shown that an audience less committed to, and interested in, conservation are likely to be more difficult to persuade than an interested and committed audience such as the visitors to Chelsea Physic Garden. Possibly a stronger inducement might have had a greater effect on this audience.

8.3.2.2 Perceived behavioural control

This research would indicate that more work needs to be done on what the barriers are to carrying out the action of taking litter home, and then attempting to remove these barriers. Attitudes towards taking litter home at Studland were favourable but less people showed an intention to carry out the behaviour. This is a study where Ajzen's (1988) modified Theory of Planned Behavior is probably a more appropriate theory to guide the intervention because it allows for personal deficiencies and external obstacles which get in the way of performing the behaviour, even if the person has strong positive attitudes towards the behaviour.

> 'People who believe that they have neither the resources nor the opportunities to perform a certain behavior are unlikely to form strong behavioral intentions to engage in it [the behaviour] even if they hold favorable attitudes toward the behavior and believe that important others would approve of their performing the behavior.' (Ajzen,1988: 134).

The role of normative beliefs was not investigated in the study. These are described

as, 'beliefs that specific referents think I should or should not perform this behaviour' and the motivation to comply with those referents. Further research would be useful to investigate whether the normative beliefs are at all prominent in influencing this behaviour. The normative beliefs were not included in the study because it was felt that in the beach situation the influence of friends, family and important others would not primarily influence attitudes and behaviour towards taking litter home for disposal. However, there could well be a normative influence on the more visible behaviour of leaving litter on the beach. In the case of teenagers, if there had been many groups of teenagers interviewed then there might have been a strong normative influence through peer group pressure. In fact, in this study the majority of groups on the beach were not teenage groups, young people tending to be part of family groups. A study carried out by Encams (2004, www.encams.org.uk) 'Youth litter segmentation research' of 13-16 year olds showed that certain teenagers would be inclined to litter when in gangs and groups because it was the done thing to do. The appearance of the place was important in determining whether they would drop litter, they tended not to litter near their own homes as it would spoil the appearance. The Encams study suggests that the subjective norm is important to teenagers, however in the Studland study teenagers tended to be part of family groups. Further research is needed to investigate whether normative beliefs do have some influence on the behaviour of taking litter home.

8.3.2.3 Importance of follow-up later

In contrast to the Chelsea Physic Garden study, no follow-up was undertaken of the Studland visitors. The Studland litter study relied upon visitors reporting on intended behaviour rather than recording actual behaviour because the questionnaire was used during the visit, rather than after the visit or as a follow up. However, this could be a valuable focus for further enquiry, as research at Chelsea Physic Garden showed that visitors remembered and acted upon information they have seen on a visit some time later from the visit. This does not necessarily show up in an interview undertaken during or immediately after the visit, as Stevenson showed in his research at the Science Museum (Stevenson, 1991). It is possible that those visitors who did not intend to take their litter away on this occasion might do so on subsequent occasions with further persuasion. The responses in the Studland study indicated that many visitors had

attended to the messages in the leaflet as they mentioned that they had learnt something new about the wildlife in the area (52% of respondents). So the issue is mainly one of converting more of the positive attitudes to intention and behaviour rather than increasing awareness.

8.3.3 Avebury

In the third study at Avebury a different and more difficult behaviour to change was targeted with a persuasive communication in a leaflet to test further the use of persuasion as a management tool and the applicability of the Ajzen and Fishbein Theory of Reasoned Action. The leaflet aimed to change visitors' attitudes and behaviour towards erosion. Before the leaflet was produced an investigation was made into visitors' beliefs about their contribution to erosion on the site (in 1999) in order to guide the persuasive communication. The Theory of Reasoned Action model was used to target beliefs that visitors' footsteps caused erosion and to avoid eroded areas. In the survey carried out in the summer months at Avebury prior to producing the leaflet a minority (23%) of the respondents held the belief that they were causing any adverse impacts on the site and 3.9% felt they might cause wear and tear. However when the leaflet with the persuasive communication was used in the winter months and a survey was undertaken in the Great Barn (in 2002) there was a far higher awareness and belief that visitors caused erosion to the site amongst all visitors. Erosion and erosion repair works were much more evident on the site in the winter months. In the winter, 40% of visitors who did not have the leaflet compared to 31% of visitors who had received and read the leaflet believed visitors to the site caused erosion. Overall 35% of visitors questioned mentioned visitors caused erosion. When looking at their own possible contribution to erosion, 40% of visitors who did not receive the leaflet compared to 25% of those with the welcome leaflet thought their own visit caused erosion, an overall response of 31% of visitors questioned. Avebury is an open space sight free to all to enter, but the audience in the first study (in 2002) were all visitors paying for entry to the exhibition on Avebury in the Great Barn. They tended to be the more interested visitor with the majority (60%) visiting for historical or archaeological reasons rather than walking the dog. They may have been highly educated about erosion with positive beliefs and

attitudes toward erosion control, therefore there was not much room for the leaflet to have an impact and influence a behaviour change. Or they may not have looked at the leaflet in any detail and attended to the message. The message in the Avebury leaflet was fairly discreet being placed to one side of the map.

The investigation was then repeated with a shorter more targeted questionnaire (in 2004), undertaken outside *on the site* amongst the standing stones on the wider group of a sample of all visitors. This was to investigate further the impact of the leaflet and to find out whether there was any influence from the subjective norm. This survey found that 24% of all respondents thought visitors caused wear and tear on the site and 22% thought their own visit caused wear and tear or erosion. 35% of those questioned were influenced by the leaflet, and also by erosion control signs on the site, to avoid eroded areas. In contrast to 2002 in the second survey (in 2004) the people surveyed were more general interest 'day out' visitors who may have been more responsive to a persuasive message about erosion and given the leaflet more attention.

8.3.3.1 Influence on beliefs

The beliefs targeted at Avebury were those regarding where visitors walked and in particular not walking on eroded areas and areas where erosion control was taking place. Unlike the Studland study, prior to producing the persuasive communication, research was carried out into visitors' beliefs and attitudes towards erosion and their beliefs regarding their own impact on the site. An interesting difference was shown between summer and winter visitors in the two years the surveys took place. In the summer months a small percentage (3.9%) of visitors surveyed believed their visit had any effect on the site causing wear and tear. In the winter months, 25% of visitors questioned who had received the welcome leaflet and 40% of visitors who had not received the welcome leaflet believed their own visit caused erosion to the monument. Erosion and erosion repair were much more visible in the winter because areas of the henge monument were roped off to allow grass to be reseeded and recover. These areas were signed with an explanation of the work going on and a request for people to avoid the eroded areas. Erosion was also much more visible because the weather in the winter, combined with the number of visitors using the

site, caused the paths to be muddy. Attitudes towards not walking on fenced off areas were positive in the original questionnaire prior to using the persuasive communication, with 65% of visitors saying it was an acceptable action compared to 21% saying it was unacceptable (14% said don't know). In the 2002 questionnaire no-one stated that they had changed their behaviour as a result of the persuasive communication on erosion. However the results of the 2004 survey differed with 35% of respondents influenced by the leaflet which was more targeted.

The lack of impact of the leaflet in 2002 may be due to attitudes being held which were already strongly positive towards the behaviour of avoiding eroded areas. The persuasive communication in the leaflet may have been too small to have any effect, attention being focused on the useful part of the leaflet which was the map. Placing the questions regarding the leaflet at the end of the questionnaire may have influenced the results with people not giving the question enough thought. This does not mean that the persuasive communication in the leaflet had no effect but that no effect was recorded by this method in 2002 because awareness was already high. In contrast in 2004 the persuasive communication has had an effect on 35% of respondents.

8.3.3.2 Follow-up

There was no follow up of the Avebury study although questionnaires were carried out on more than one occasion. As a consequence although the Avebury study showed actual behaviour as the persuasive communication was targeting behaviour during a visit, it was not able to show any long term effects of the persuasive communication.

8.4 Other factors

8.4.1 Mode of communication

There seems to be little research available on the effects of different communication medium in persuasion. O'Keefe (2002: 254) states that 'surprisingly little research has concerned the effects of variations in communication medium on persuasive outcomes. In part this reflects the difficulties of undertaking useful research in this

area'. Because different media possess different attributes it is often difficult to separate out which of the attributes of the communication medium may have been responsible for any observed differences in effects.

To enable comparisons, the main features of the three studies are summarised, Table 8.1.

Table 8.1 To compare and contrast the three different studies, Chelsea Physic Garden, Studland and Avebury

	Chelsea Physic Garden	Studland	Avebury
Type of media	Exhibition, leaflet, plants and labels	Text embedded in leaflet	Text embedded in leaflet and signs
Action	Change own gardening practices	Take litter home	Not walk on eroded areas
Choices for action	A number of choices	One action	Choices of where to walk
Beliefs targeted	Existing –could be novel?	Novel	Existing
One or many messages	Many	One	One (+panels)
Audience	Interested gardeners	Leisure (wide)	Leisure (wide)
Content of message	250+ words	46 words	78 words
Success of persuasion	Good	Limited	Some
Barriers to action	No garden	Difficulty of taking litter home	Limited where people walked
Follow-up	Yes	None	None

In each of the studies the messages and the situations varied as well as the communication medium, so direct comparisons are difficult, Table 8.1. However, the research shows that the study using an exhibit was more successful in influencing attitudes and behaviour than the two studies using leaflets. This may be due to the need in a successful persuasive communication to include all the elements of information and inducement or persuasion, and link the behaviour to various positive or negative outcomes. The leaflets in each of the studies may not have incorporated enough of an inducement to persuade visitors due to limited space for information. Although the Studland leaflet was read, and did increase awareness both of the importance of the wildlife in the area and the cost of litter removal, it had a limited

effect on intention to take litter home for disposal. In the Avebury study there was evidence of the leaflet being looked at, 51% of people interviewed stated that they had looked at the welcome leaflet and 27% said the information had changed what they did in the first survey. Most of the changes were about visiting the new exhibition in the Great Barn. In the second survey there was more evidence of influence on erosion control with 16 out of the 19 people interviewed who had read the leaflet being influenced to avoid worn areas, 35% of the people questioned overall. The restricted space in a leaflet and the need to use the leaflet for other purposes, such as orientation and promoting the work of the organisation, may have limited its use as a persuasive communication. In conclusion an exhibition or display has more chance of being effective as a persuasive communication as there is more scope to include all the elements of a persuasive communication. A leaflet needs to carry the entire elements essential in a persuasive communication; information, inducement and linking the behaviour to positive or negative outcomes to be effective. The persuasive communication also needs to be the main message in the leaflet rather than an additional message to others. The text in a leaflet must be more than minimal to be effective as a persuasive communication.

8.4.2 A comparison of the different actions targeted

The different persuasive communications in each of the three studies were targeting different actions. In the Chelsea Physic Garden study the overall action was wildlife-friendly gardening and this was made up of a series of suggested actions - planting native trees and shrubs, using organic gardening methods that avoided using chemicals and pesticides, using a compost heap, not buying bulbs dug up from the wild and observing the wild animals and birds which used the garden and seeing what plants they fed on. This gave the possibility of a number of different actions to carry out. In contrast the Studland leaflet was targeting only one single action, to take litter home. Whereas, visitors questioned at Chelsea Physic Garden were able to change their behaviour and garden in a wildlife friendly way by carrying out one of a choice of actions. If there was a barrier to one action they were still able to carry out others. In fact some people mentioned when interviewed that they were not able to have compost heaps but they did change their behaviour in other ways. In contrast at

Studland there were no alternative actions to taking their litter home so this may have limited the possibilities for positive behaviour change. The Avebury persuasive communication gave two possible actions, 'not walking on paths marked with erosion control signs' and 'keeping out of fenced off areas'. These did not seem to limit behaviour change as there was plenty of choice on the site to use different paths without restricting access.

8.4.3 Content of message

The content of the text and the way it is written is crucial, as it must form a persuasive communication. This contains the elements of information and some form of inducement or persuasion, linking the behaviour to various positive or negative outcomes, and targeting the beliefs about the behaviour. It is unlikely that information on its own would have enough effect to influence behaviour change. Although the information only thesis was not tested in this research study it has been shown to be true by other studies. For example, Ajzen and Fishbein (1980) argue the importance of the content of the message, and tested the effects of differently structured messages on changing the behaviour of alcoholics. They found that both the positive and the negative message significantly increased signing up for the alcohol treatment unit (ATU) in those that were initially unwilling. In contrast the traditional appeal which did not contain an attack on the receiver's beliefs about signing up for the ATU had a boomerang effect and reduced the signing up behaviour by 50%.

The exhibit at the Chelsea Physic Garden contained all the content needed for a persuasive communication. The information was about plants in danger, why plants need to be conserved, what the visitor can do to help conserve plants, the importance of gardens to wildlife and what visitors can do in their own gardens to help wildlife. The inducement was a moral one - that we will leave future generations an environment fit to live in. Also, we have a responsibility to future generations to conserve the biodiversity of our planet.

The leaflet at Studland contained information about the wildlife in the area, and the

persuasive message that more than £30,000 is spent each year removing litter from the beach and in the bins. 'Help us to keep the beach clean by taking litter home, and let the money be spent on wildlife instead', was the inducement part of the message. One of the drawbacks of using leaflets for persuasive communications is the limited space, especially when the leaflet has multiple purposes. The limited results of the Studland study suggest that elaborating the persuasive message further and giving further reasons why the behaviour of taking litter home is beneficial may increase the number of visitors taking their litter away with them. This is because the existing message only gave one inducement which was to save the National Trust money and this may not have acted on sufficient beliefs to change the behaviour. Alternatively resources could be invested in finding the barriers which were stopping visitors from carrying out the action.

The leaflet at Avebury contained the information that the visitor's footsteps count and every footstep causes wear and tear. To help combat erosion don't walk on paths marked with erosion control signs and keep out of fenced off areas. The inducement was to help keep the special monument for future generations to enjoy. The study found that the persuasive communication was attended to by about a third of those questioned. This may have been due to the map distracting attention from the persuasive communication or the discreetness of the message itself in the leaflet. More content in a more prominent position in the leaflet may well help this persuasive communication. The erosion signs on the site at Avebury seemed to have influenced a similar number of respondents compared to the leaflet. On a site where it is difficult to distribute leaflets, signs may be a more effective and immediate persuasive communication although space on signs for content is limited.

The information was targeted at beliefs about the behaviour in all cases but the inducement and the linking of behaviour to positive and negative outcomes was not as strong in the two leaflets as in the exhibition, due to the limited space in the leaflets. The research has shown that the persuasive communication in the exhibit was more successful but this may be due to a number of factors including the content of the message, the setting and the communication medium. Further work needs to be done on the content of the persuasive communications to investigate whether

improved or elaborated content would result in stronger intentions to carry out the required behaviour in the situations where the leaflets were used.

8.4.4 Audiences

A further advantage of conducting three different studies for comparison lies in the different audiences who were the subjects of the persuasive communications. All audiences were on a leisure visit to an attraction. They were visiting for recreational reasons on a 'day-out' for enjoyment rather than to study or learn. Unpublished research carried out at 20 National Trust sites during 2003 found that the majority of visitors to National Trust properties go for a day out and don't have high expectations to learn, although 73% of visitors questioned came away from a visit saying they had learnt something new.

The visitors at Chelsea Physic Garden were mainly people interested in gardens, many of them with gardens of their own. The persuasive communication tapped into their interest and positive attitudes towards gardening. In contrast, the second audience at Studland beach were a more diverse audience, visiting Studland for the beach, sea and sunbathing because the beach was a clean and pleasant place. They did not show any particular interest in litter or its disposal but some did show that they had an interest in the wildlife and in keeping the beach pleasant (Studland beach backs on to a National Nature Reserve). The persuasive communication was not tapping into an already positive and salient belief. Although many of those questioned did show a positive attitude to taking litter home this did not follow through into an intention for the majority (63% intended to put their litter in the bin on the beach compared to 37% who intended to take their litter home, whereas 92% agreed they should take their rubbish home). This was a harder audience to convince to make a behaviour change and the research shows that more work needs to be done in investigating the barriers to action, through using the perceived behavioural control model. In the Avebury study different results were obtained when different sites were used for carrying out questionnaires within the overall site, as different audiences were investigated at the different sites. The initial study carried out to find the salient beliefs of visitors to Avebury tapped the majority of visitor groups by

interviewing in the main car park. Salient beliefs and awareness of erosion were found to differ between the different visitor groups. Day out and casual non-specific groups were those least aware of erosion and their contribution to it, although there was no lack of understanding of erosion per se. The study of the effect of the persuasive communication on visitors to the Great Barn showed a lack of impact as these visitors were very aware of erosion problems on site. This group was a sub-set of the main visitor population containing mainly people interested in archaeology and a higher than normal proportion of National Trust members. About a third of those questioned (31%) felt their visit caused erosion, 12% of those had seen the welcome leaflet with the persuasive communication and 18% had not. However there was no mention of the persuasive communication in any of the respondents' questionnaires. Either there was a problem in getting the messages through to this group (i.e. they were not looking at the leaflet in any detail) or they were ignoring the messages, possibly as not being relevant to them. A further survey which was carried out on site of the wider visitor audience showed 47% aware of their contribution to erosion and evidence of impact of the leaflet with just over a third (35%) influenced by the persuasive communication. These findings are valuable because they show that it is really important to investigate the audience that the persuasive communication is targeted at and to use an effective method to reach the visitors. Some audiences are more receptive than others.

A study carried out by Gilg and Ford (2003) looked at the environmental actions of different audiences. They conducted an ESRC funded research study to measure attitudes and behaviours of individuals towards environmental action in their own home. One of the objectives was to find out what factors accounted for difference in the types of attitudes and behaviours. They found that there were four types of individual according to their behavioural characteristics.

'Two groups of individuals stood out in particular. One group participated in almost all of the activities mentioned in the questionnaire (committed environmentalists), whilst another did almost none of the behaviours (non-environmentalists)...Non-environmentalists comprised a distinct social group, being young,

> male, poorly educated, on very low incomes, with a high proportion renting from a local authority ad being politically apathetic.' (Gilg & Ford, 2003 :15).

The study concluded that the major policy recommendation was to focus on the distinct social group of non-environmentalists, and not waste valuable resources on broad-brush campaigns to convince the converted majority that helping the environment is good.

In contrast to the Gilg and Ford study, this research has found that even when people believe that helping the environment is good they still need persuasion to change their behaviour. The committed gardeners visiting Chelsea Physic Garden had positive attitudes towards the environment but still needed the information and inducement in the persuasive communication to change their behaviour. The visitors to Studland beach valued the safe clean environment and had positive attitudes to taking their litter home but needed more persuasion than that used in the leaflet to actually undertake the action. The barriers preventing them from converting their positive attitudes into behaviour needed investigation. The study of visitors to Avebury showed that different interest groups reacted to the persuasive communication in different ways. The persuasive communication in the leaflet was more effective with the general visitor than those interested in archaeology.

The Gilg and Ford research also found that:

> 'Committed environmentalists were more likely to believe that they acted under social pressure to consume sustainably than any other group. To this end, it may be that the new environmentalism may rest less on promoting the environment and more with using social norms to change personal behaviour' (Gilg and Ford, 2003 :25).

This supports the Ajzen and Fishbein theory of reasoned action which acknowledges the importance of normative beliefs. In this research the influence of social norms has not been investigated in detail. Further research would provide a useful insight.

8.5 Use of Theory of Reasoned Action model

Many examples of research aiming to change behaviour have been reviewed, but few have been found to look for a model to use in successfully carrying out a behaviour change in the environmental setting, although much work has been carried out in health and fitness areas. A meta-analysis of the theory of planned behaviour by Armitage and Conner (2001) contains about 90 references out of 290 with health and fitness themes including exercise, condom use, smoking and diet. Eden (1996) writing about public participation in environmental policy states:

> 'Policy tends to assume that providing environmental information and education will secure behavioural change, when behaviour is in fact intimately dependent upon public interpretations of the issues. I am therefore arguing that we need to consider more than 'scientific' understandings held by the public when we address environmental policy.' (Eden, 1996: 183)

Although Eden has stated information on its own is not enough there is no acknowledgement of the value of behaviour change methodology. There is, for example, no attempt within the paper to look at how behaviour can be influenced by using a model taken from the social psychology literature. It is the implementation of a clearly structured method or model of behaviour change which has enabled success in the study at Chelsea Physic Garden. The Ajzen and Fishbein model of behaviour change has proved to be a model which can be implemented and show results in changing behaviour.

An advantage of the Theory of Reasoned Action over other theories is that the sequential steps which lead to behaviour change enables analysis at each of the steps in the sequence to monitor the success of the behaviour change. A person's beliefs about the behaviour can be investigated. Similarly a person's attitudes towards the behaviour and intentions with respect to the behaviour can be tested. If the behaviour is subject to normative influences such that family or friends may have an influence

on whether the behaviour is performed or not the subjective norm can be analysed. In this research the behavioural intentions have given a useful indicator of the likelihood of the behaviour being performed in the Studland study and the discrepancy between positive attitudes and behavioural intentions has shown that a possible barrier exists to the performing of the behaviour. The subjective norm is an area of the model which has not been investigated in any depth in this research because it was felt that its influence on the behaviour was not a strong as the beliefs underlying the attitudes for the behaviour changes being sought. However, the study at Avebury (2004) has shown that there was a possible influence from friends and family on the behaviour change. 47% of respondents agreed that friends and family believed that causing erosion at Avebury should be avoided compared to 27% who disagreed. 57% of respondents agreed that they were influenced by their friends and family compared to 20% who disagreed. This suggests that the persuasive communication could be strengthened by adding a component which influences the subjective norm. Further study of the influence of beliefs on the subjective norm prior to producing a persuasive communication may help to strengthen the message for some types of behaviour.

A different model of attitude change is the Elaboration Likelihood Model (ELM) (Cacioppo and Petty, 1981). This model proposes that there are two basic routes to attitude change.

> 'One route - the central route - is taken when persuasion results from thinking about the issue or argument under consideration. The other route - the peripheral route - results when persuasion results from non-issue-relevant concerns such as impression management motives, the attractiveness of the message's source, or one's social role.' (Cacioppo & Petty, 1981: 262).

The flow chart used to describe the two routes includes questions such as: 'Is the person motivated to process the communication?', 'Is the person motivated to be able to think about the issue under consideration?', 'Does the person have the ability to process the communication?' It is not easy to ascertain the answer to these

questions before planning to influence individuals through a persuasive

communication. A person could be motivated on one day but not on the next. This makes it much more difficult to prepare a persuasive communication using this model, as a successful result depends not on how persuasive the argument is but on the motivation of the receiver at the time. Cacioppo and Petty (1981) acknowledge the difficulty of the central route to change attitudes:

> 'Clearly, the elaboration-likelihood model indicates that it is quite difficult to produce an enduring attitude change by exposing people to a persuasive communication. The recipient of the message must have both the motivation and the ability to process the information contained in the communication, and the information presented must elicit favorable cognitive responses that are rehearsed and stored in long-term memory. Favorable cognitive responses will be elicited only if the message recipient finds the message arguments to be compelling...In many cases, however, the problem is even more basic - just motivating people to attend to and think about what you have to say!' (Cacioppo and Petty, 1981: 266).

Whilst the motivation of the receiver is a salient point the ELM does not assist in guiding the construction of a successful persuasive communication which will motivate the recipient. In contrast, research using the Theory of Reasoned Action has shown the type of message which is successful and why e.g. messages used in the treatment of alcoholics, section 2.5.1 (Ajzen and Fishbein, 1980: 230). This research has shown that in the studies which showed limited behaviour change the Theory of Reasoned Action has still been shown to be a useful model to guide the work because it enables an investigation as to why the studies were less successful by clearly showing the mechanism for behaviour change. For example, the Studland study has revealed that there are strong positive attitudes towards taking litter home but these do not translate into intentions. Further research can investigate the barriers to translating attitudes into intention which affects this part of the TRA model.

8.6 Factors contributing to successful behaviour change

The three research studies undertaken have given a valuable insight into factors which contribute to successful behaviour change using the Theory of Reasoned Action as a model and employing a persuasive communication as the technique. In a situation where there are already positive attitudes towards the behaviour, achieving a change in the behaviour is likely to have more success. In the Chelsea Physic Garden study this was found to be the case as the majority of visitors were interested gardeners with positive attitudes towards wildlife in their own gardens. Of those who visited the display 35% made changes to the way they gardened to be environmentally friendly. Where there are barriers which prevent or make it more difficult for a particular behaviour to be achieved these need to be investigated and overcome. The modified theory of planned behaviour, with the addition of perceived behavioural control as a component, is a more useful model to use in situations where there are obstacles to action because it allows for the possibility of a lack of ability to perform the required action, rather than just a negative attitude or subjective norm. The Studland study showed that investigation into barriers to carry out the behaviour might improve the results of behaviour change. To carry out a successful behaviour change the recipients must have the ability to comply with the change.

A behaviour change which restricts freedom is less likely to be successful. The research at Avebury found that visitors were not favourable to being restricted to only certain paths or having parts of the monument closed. However, as long as there were alternative paths visitors were able to comply, as closing off certain paths while erosion control measures were being put into practice was inevitable. Roggenbuck (in Manfredo 1992: 165) suggests that 'Even if recreationists initially oppose the rules, persuasive messages explaining the reason for specific rules and communicating the environmental and social impacts of problem behaviors may alter opinions and gain the necessary compliance'.

The inducement used in a persuasive communication will only be effective if it is

one which people want to comply with or accept. In all three studies the inducements given for action were for environmental reasons and only in the Chelsea Physic Garden study was there personal gain for the participant, in that improving the garden for wildlife could give participants personal pleasure. The inducement in the Studland study was to the benefit of the National Trust, in that it would save the Trust money if people took their litter home. The inducement at Avebury was for the benefit of future visitors. If people were just acting for personal benefit then only the first persuasive communication would be likely to have an appreciable effect. In fact all three persuasive communications had some effect showing that people are willing to carry out actions for moral and ethical reasons. Following on from this the behaviour change is more likely to be acceptable if the person changing their behaviour can see an advantage for themselves in carrying out the action.

8.7 Wider role of persuasion in museums

Persuasion could be used much more widely in museums, visitor centres, zoos and botanic garden displays than is the case at the moment. This statement is backed up by Knapp et al, (1997) when they state:

> 'It has been argued – but not empirically demonstrated – that environmental interpretation can and should influence visitors' attitudes or behaviour toward the use of natural resources. That would include those resources that are the immediate subject of interpretation as well as those beyond the site.'(Knapp et al, 1997: 24)

There are many instances when an exhibit is set up with an obvious message but this is presented as fact rather than in the form of a persuasive communication. A study on the impact of a zoo visit on attitudes showed conflicting results, with widely read visitors being less positive about antelopes being worth saving after a visit than before (Bitgood, 1992). The information in the zoo had not been targeted to change attitudes towards antelopes and would no doubt have had more effect if the information was specifically written with that goal in mind and had used persuasive communication as a technique.

Few studies have looked at the effect of exhibits on actual behaviour change before the present study, although intended behaviour change has been investigated through a study of change in attitudes towards urban wildlife after visiting an exhibition on urban wildlife (D'Agostino & Loomis, 1992). These researchers were assessing the effectiveness of the 'Close to Home' exhibit, about urban wildlife in Colorado, in changing visitor attitudes towards such wildlife. The exhibit was not actually designed to change attitudes but to create awareness that many species inhabit urban regions. In Colorado an increasing number of confrontations between people and mountain lions had culminated in a lion killing a teenager out jogging. The researchers found that a trip through the exhibit improved visitor attitudes towards bears and lions but not towards birds and docile mammals. (The control group showed an already positive attitude to both birds and docile mammals so there may not have been room for change in these aspects). From the questions on intended behaviour it was found that, although attitudes towards bears and lions improved the exhibition did not lead to a greater likelihood of visitors performing related and appropriate actions. The researchers explained this finding by suggesting that the finding could either be due to choosing irrelevant behaviours related to the animals or that attitudes toward bears and lions do not predict any related intended behaviours. However, another explanation for this result could be that the exhibit did not contain a suitable persuasive communication in relation to behaviour towards bears and lions.

The approach adopted in this research has a much wider use than is currently realised. Museums mount exhibitions to inform the public and educate through informal learning. There are many instances where exhibitions could influence attitudes and behaviour. An example might be the Ecology exhibition at the Natural History Museum (soon to be refurbished). This exhibition ends with a strong conservation message about human destruction of the environment but does not lead into what the solutions might be and how behaviour could be changed or encourage the visitor to take some action. This is a huge missed opportunity. Museums are about more than just presenting facts and objects to the public, they also have an educational remit. Changing attitudes and behaviour is an objective of environmental

education and it is not enough to present the problem without at least giving the visitors information on how they can make a difference. Even if attitude change is not a formal objective of a particular exhibition, understanding the beliefs and attitudes of visitors can improve the overall interpretive effectiveness of exhibits in getting messages over to the public. To achieve this outcome, information needs to be targeted at the audience, the beliefs and understanding of the audience need to be known before the exhibition can be designed otherwise the designers risk completely missing their target. Another example of a museum that has taken a different approach with its exhibitions is the Imperial War Museum North. Instead of glorifying war it has three introductory videos, with the overall title, the 'Big Picture', which really act on visitors' beliefs about war.

> 'The Big Picture exposes issues that lie at the heart of all wars and conflicts. Deliberately thought-provoking, they encourage debate and discussion about strong, and often controversial, subjects.... In Why War? Children, academics, a journalist, a soldier and a psychologist talk about the causes of some of the major wars in the last century. They also discuss the possible causes of future wars and how they might be prevented.' (Forrester, 2002: 6 &7).

Another presentation looks at weapons of war and the third looks at the impact war has on children. Child soldiers speak frankly about being on the front line. Children talk about how they have survived war and their hopes for the future. They are all highly emotive issues which are projected around the whole of the main exhibition area and are designed to make people question the purpose of war and in short to affect behaviour.

8.8 Persuasion, Interpretation and Countryside Management

The use of persuasion to change behaviour is a useful tool in managing the countryside. Knapp et al, (1997) searched the interpretative literature for documents which contained principles, goals and objectives for environmental interpretation. 19 documents were found published between 1957 and 1992. An analysis of key words

and phrases in the 19 documents found that behaviour change had more citations than any other key word (22 citations compared to 'appreciation of the site' which had 9, the total number of citations was 101), illustrating the importance of behaviour change outcomes for a significant proportion of the interpretive field. Countryside interpretation is often used as a management tool and to encourage changes in behaviour, for example, a new route may be explained or a particular management practice described or the reason for a restriction explained through information and interpretation. The use of a persuasive communication targeted at the existing beliefs of the visitor would help in persuading visitors to comply with management messages e.g. dogs on leads. Although the message that dogs should be kept on leads may be a simple one, there are many reasons why a visitor might not comply. These vary from the simple belief 'my dog is under control and does not need to be on a lead' to the more complex belief that 'dogs do not need to be put on leads whatever the sign may say'. Understanding the beliefs of visitors, in this case beliefs about their dogs, can guide the targeting of the message to be an effective persuasive communication. Roggenbuck (in Manfredo, 1992) analyses the potential for persuasion to reduce undesirable visitor behaviour in the countryside. He proposes that persuasion has little effect against illegal and unavoidable behaviour, moderate effect against careless actions e.g. littering, high effect against unskilled actions such as selecting an improper camping spot, and very high effect against uninformed actions such as using dead snags for firewood. Using this analysis the behaviour of visitors to Avebury in choosing where they walk probably falls into the uninformed action category and the persuasive communication should therefore be an effective way of managing behaviour change.

8.9 Health care

Many examples of the use of a persuasive communication come from the area of health care e.g. alcoholic treatment unit (Ajzen & Fishbein, 1980: 231), attitudes towards smoking (Marin, Marin et al, 1990), intentions to minimize sun exposure (Steen et al, 1998), Teenage sexual behavior (Gillmore et al, 2002). Wide use is being made of the Ajzen and Fishbein model of behaviour change in health care to persuade people to alter their health damaging life styles. Steen et al (1998)

investigated Australian adolescents' attitudes, intentions and behaviours to minimize sun exposure. The study found that the basic determinants, attitude toward the behaviour and subjective norm, while significant predictors of intention, only accounted for 30% of the variance. In addition, attitude toward having a suntan, considered an external variable to the attitude to minimize sun exposure in this study, significantly increased the prediction of intention. At least in this behavioural domain other aspects besides attitude toward the behaviour and subjective norm were operating. The results showed that a suntan was perceived as a symbol of attractive physical appearance by the majority of participants which indicated that preventative campaigns were dealing with a behaviour which had an objectively observable, socially acceptable, physical outcome, as opposed to other behaviours, e.g. smoking. The results suggested that public health campaigns need to address the positive image of a suntan held by adolescents. There are parallels between this study and the study of litter disposal at Studland. In the Studland study the attitude towards the behaviour of taking litter home to dispose of it was stronger than the intention. In the Studland study the modified theory of perceived behavioural control seems more appropriate than external variables to explain the variance between attitude and intention. The Steen at al study did not consider the possible use of the modified theory of perceived behavioural control to explain and predict their outcome. Other health care studies have found the Ajzen and Fishbein Theory of Reasoned Action and Theory of Planned behaviour useful models for predicting behaviour e.g. Giles and Cairns (1995), Rhodes and Courneya (2003), Hoogstraten et al (1985 in O'Keefe 2002).

8.10 Limitations of the results of the research

There are limitations to the some of the results of this research. The results would have been strengthened by the completion of more questionnaires in the Chelsea Physic Garden study and the Avebury study. The limit was simply pragmatic issues of time and resources. The group of people interviewed in the Chelsea Physic Garden study were a discrete group of 'garden visitors'. The same results might not have been achieved by using the exhibit and interviewing in a place with more of the general public such as a library or shopping centre as these people may not have had

a positive attitude to gardens and gardening let alone be open to persuasion to garden in a wildlife friendly manner. It is difficult to isolate effects of the visit to Chelsea Physic Garden and in particular the exhibit from other intervening effects such as television programmes and magazines, when looking at long term effects, as the follow up interviews were conducted 3-6 months after the visit. The way this was done was by asking in the questionnaire:-

Q.8'What changes, if any, have you made in the way you garden since reading the booklet or seeing the display?'

Followed by:-

Q.9'Were these changes prompted by the booklet or the display?'

This question allowed people to identify any changes made as a result of seeing the exhibit. A later question was:-

Q.12 'Have you read or seen anything on television which has made an impression on the way you behave towards the environment and wildlife in your home and garden?'

This question enabled the other intervening effects to be isolated from the effect of the garden visit. Another limitation is the difficulty of observing behaviour and the need in this research to use reported behaviour. This relies on the honesty of respondents; there can be a tendency for respondents to a questionnaire to give the answers they think you want to hear, particularly when the questionnaire is completed through interviewing the respondent.

8.10.1 Limitations of the methodology

The research method itself has limitations. Potter & Wetherell, (1987) in 'Unfolding discourse analysis' state that people use their language to construct versions of the social world and this leads to language variation. In surveys only a constrained selection of a participants discourse is collected on one discrete occasion.

> 'It is often only possible to respond 'yes', or 'no', 'don't know' or 'agree', 'strongly agree' etc to a survey question. The possibility of respondent giving *contrasting* views on a topic is again precluded; ambivalence, the expression of flexible options tailored to the context

and inconsistent responses are ruled out by the response format.... There is considerable literature to show that subtle variations in question wording can lead to large differences in responding and that people can contradict themselves and make 'incoherent' claims when responding to opinion questionnaires.' (Potter & Wetherell, 1987: 40).

To avoid some of the pitfalls Potter and Wetherell suggest, the questionnaires all used a range of 'open' and 'closed' questions to gather the range of opinions rather than constraining respondents to yes/ no answers. However, although it is still true to say that the discourse collected by the questionnaire technique is constrained, questionnaires have been shown to be an acceptable way of collecting information of the type used in these surveys through many other studies. Whilst the depth of responses may not be that obtained from interviews, such methodology enables larger data samples to be collected.

Potter & Wetherell also suggest that in analysing interviews or texts researchers can make selections which simply mirror their own prior expectations by selecting out those parts which appear significant. In this situation the data can be used simply to buttress the favoured analytical story rather than being used to critically evaluate it. Also broad categories used in content analysis can easily obscure theoretically interesting differences in discourse. This is a real consideration so to guard against biased selection of responses and coding, the coding for the open ended questions in the Chelsea Physic Garden questionnaire were coded independently by two people and the results compared for bias.

8.10.2 External validity

The extent to which results from this study can be generalized beyond the particular study vary. The results of the Chelsea Physic Garden should be true of visitors to other gardens but the sample was one of garden visitors so it could not be generalized to a shopping centre for example. The MORI poll for the Royal Horticultural Society (2003) of active gardeners gave results which supported the

Chelsea Physic Garden study. The results of the Studland study could be generalized to other similar beach situations and indeed the latest Marine Conservation Society survey shows an urgent need to persuade beach users to take their litter home.

> 'Beaches in Britain are at their dirtiest for more than a decade, a survey claims. Researchers from the Marine Conservation Society, who carried out the survey published yesterday, said beachgoers were largely to blame for a 29 percent rise in rubbish density in 2003 compared with the previous year.' (Beard, 2004).

The Avebury study is composed of reasonably small samples especially the final one in 2004 (45 respondents). The earlier study (2002) was a discrete sample of visitors not representative of the main visitor population to Avebury. Although I would expect to gain similar results on a similar site – such as Hadrian's Wall to the 2004 survey, care should be taken in generalizing from a small sample.

8.10.3 Limitations of persuasive communications

This research has shown some of the limitations of persuasive communications, where they are successful in their own right and where coercion or inducement needs to be used as well. Where the audience is positively disposed, as in the case of Chelsea Physic Garden, a persuasive communication is more successful than in the situation where the behaviour does not have immediate positive effects (and reward) for the person carrying it out as in the case of Studland beach. The behaviour change at Studland beach required extra effort on the part of the visitor without giving much immediate benefit to the participant. Some form of inducement may well improve the results in persuading visitors to the beach to take their litter home.

An example of a situation where inducement helped is where the National Trust tackled transport by car when Prior Park in Bath was opened without a dedicated car park. The organisation found that it was possible to persuade visitors to use public transport and park and ride facilities to gain access to the Garden from the centre of Bath. The local residents, who opposed the Garden opening because they thought

visitors would park in their roads and block them, had their fears proved to be unfounded. Persuasion was linked with inducement in this case. All the publicity material carried information about access to the Garden by public transport. Also, various incentives were offered to visitors such as reduced price admission on production of a valid bus ticket, and a free guide book as an inducement to use public transport. The Green Transport strategy for Prior Park might not have been so successful if it had relied on persuasion alone. This raises the question as to how successful persuasive communications can be in changing the environmental behaviour of people and where persuasion needs to be supported by coercion.

Coercion involves offering a sizeable reward for compliance or a threatening punishment to induce people to behave in a certain way. An example of behaviour change by coercion might be congestion charging. This was introduced into central London in 2003 to help alleviate traffic problems. Car drivers are charged £5 a day to drive in central London. Those not paying the charge are recorded on CCTV cameras and sent a penalty charge of £100. The congestion charging scheme directly tackles four key transport priorities for London: reducing congestion; improving bus services; improving journey time reliability for car users; and making the distribution of goods and services more reliable, sustainable and efficient. It has also raised significant funds to improve London's transport system. Six months on, Transport for London's surveys (www.tfl.gov.uk, 2003) show 50,000 fewer cars per day are being driven in the charging zone, with the majority switching to public transport or other modes of transport such as bicycles, scooters and car sharing; or diverting around the zone, resulting in only 4,000 fewer people coming to the charging zone. Traffic delays have been reduced and the increased public transport capacity is successfully accommodating new bus passengers.

- Congestion in the zone has dropped by around 30% - at the high end of Transport for London's expectations; congestion is now lower than at any stage since the mid-1980's;
- the number of motor vehicles entering the zone during charging hours has dropped by 16%;
- the public remain supportive of the scheme.

It is unlikely that the drop in traffic levels would have been achieved without instituting a charge, persuasion alone would not be sufficient to encourage people to change their behaviour because it would be too inconvenient for them. This is an instance where persuasion was not the solution but coercion worked over persuasion. Another example of coercion changing behaviour where persuasion is not effective is the use of speed traffic cameras. The threat of a fine if caught speeding on camera is sufficient to persuade most motorists to slow down.

The government has set targets for local councils in household waste recycling, currently at 25% of rubbish but aiming for 33% by 2006. In Wiltshire the household waste recycling programme is not mandatory, rather it is a campaign carried out through persuasion. The programme has begun with the inducement of a kerbside recycling programme supported by a recycling box and explanatory leaflet entitled, 'Raid your rubbish'. Recycling is an area of behaviour change where persuasion should be effective. By making the recycling programme easy, householders are more likely to comply. Research carried out by Encams (2002) showed that having a waste recycling collection service was the main driver to starting to recycle items.

These examples show that there are limits to the effectiveness of persuasion; in certain situations behaviour change needs more of an incentive. However, it is always more desirable to influence behaviour by persuasion rather than coercion or regulation as behaviour change by influencing the beliefs and attitudes towards the behaviour has a lasting effect compared to the one-off effect a particular regulation might have.

> 'Persuasive communication occupies a unique position in the matrix of social influence. It is the only one of all the available strategies that appeals to reason, attempting to effect change and compliance by convincing the receiver of the validity or legitimacy of the advocated position. This tactic can be much more difficult than, say, coercion, but it has important advantages. Besides being more compatible with democratic and humanistic values, persuasive communication can produce profound and lasting change, a goal not easily attained by

other means.' (Ajzen, in Manfredo, 1992: 6)

8.11 Summary

Ajzen and Fishbein's model and the use of a persuasive communication is now recognised as a valid model and method of persuasion. It has been used in studies ranging from predicting Australian adolescents' intentions to minimize sun exposure (Steen et al, 1998), to models of condom use (Albarracin et al, 2001). This study has shown that persuasion can be used to change behaviour in a leisure setting and the Ajzen and Fishbein Theory of Reasoned Action can provide the structure to support an intervention to change behaviour. In this research the model has provided the conceptual framework to enable three different attempts at behaviour change. The model has provided the understanding of the mechanisms of behaviour change and allowed beliefs to be targeted in order to influence the attitudes and intentions towards the behaviour.

This research has shown the possibilities and limitations for persuasion in leisure settings. It is possible to a use a persuasive communication with an interested audience and achieve a behaviour change - for example an audience interested in plants and the environment will change their behaviour to garden in a wildlife-friendly way with persuasion. This was illustrated by the work at Chelsea Physic Garden where attitudes were positive towards environmentally-friendly actions in gardens but people needed information on what to do in order to change behaviour. The Studland research has shown that with a less interested audience but still positive towards the environment it is possible to have positive attitudes towards an action but it may need more than single instance of a persuasive communication to get a significant number of people to intend to change their behaviour and actually carry out the new behaviour. A strong persuasive communication with some sort of inducement is probably needed. To achieve a behaviour change it needs more than one small persuasive communication although the persuasive communication can start the process. The Avebury study showed that a persuasive communication is more successful when targeted at its audience. The general day out visitor was more responsive to the persuasive message in the leaflet than the interested

archaeologist/historian.

Persuasive communications have a wide use and could be used more frequently, especially by zoos, museums, botanic gardens and visitor centres where there are strong messages to convey and people are being managed in a recreational setting. There is also the need to use persuasive communications much more to change behaviour towards the environment and make our earth more sustainable. Such venues could carry the message and demonstrate the benefits of carrying out environmentally-friendly behaviour. Persuasion can also be effective in helping visitors comply with management messages in a leisure setting.

This thesis has sought to explore the use of persuasive communications as a means of inducing environmentally-friendly behaviours in a range of leisure settings. Whilst the research has shown that success is by no means assured, persuasion should be the first resort as it can be effective.

At the beginning of the 21st Century, inducing environmentally-friendly behaviours is perhaps even more important than when this thesis was begun. It has shown that persuasion can affect environmental behaviours - although to varying degrees. However, it is far preferable to the alternatives - regulation, coercion or inducement.

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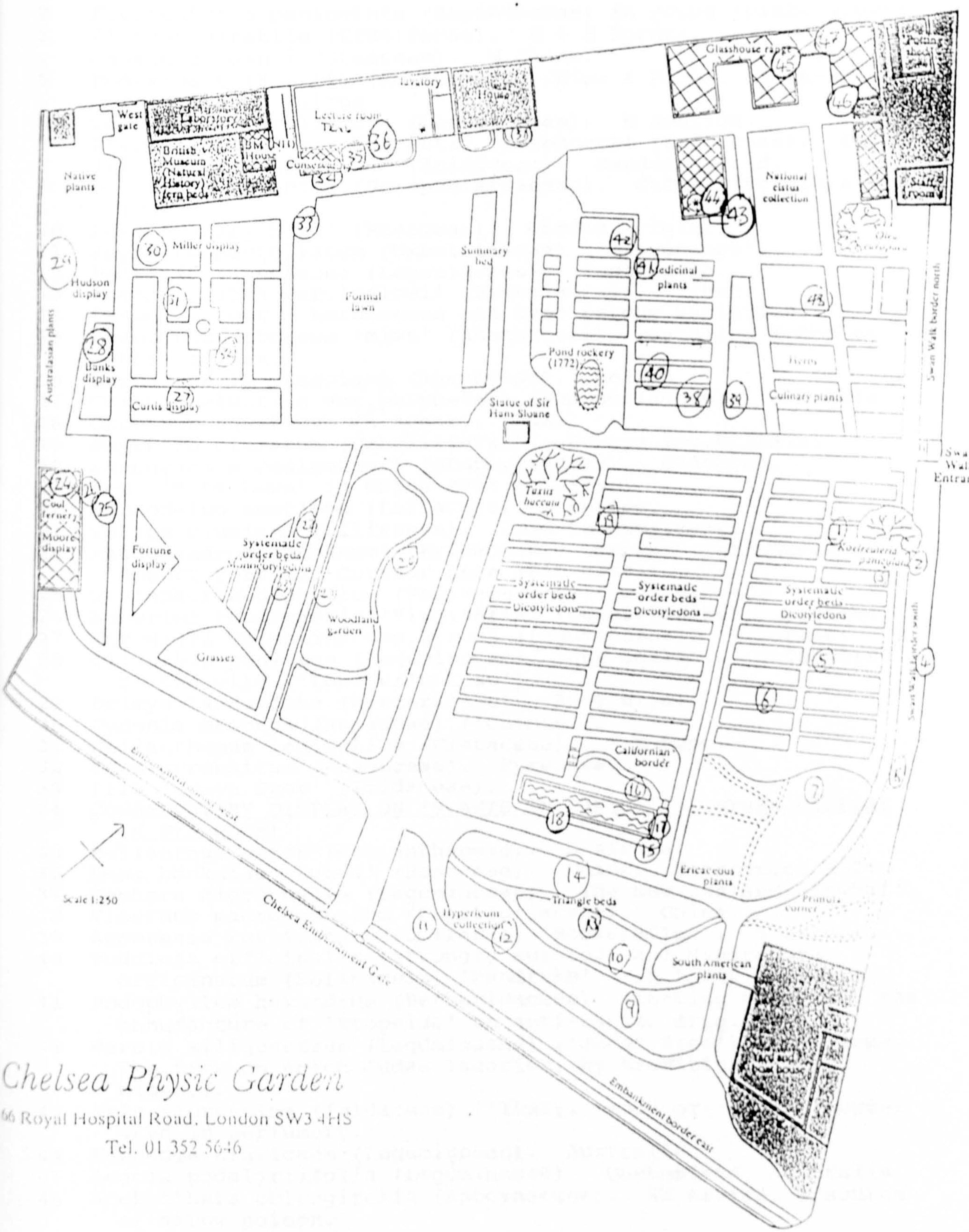
Appendix 1

MAP OF CHELSEA PHYSIC GARDEN

PLANTS OF INTEREST AS AT 22 APRIL 1992



Chelsea Physic Garden

66 Royal Hospital Road, London SW3 4HS

Tel. 01 352 5646

* Information desk manned on public open days

private areas, visitors not permitted

PLANTS OF INTEREST AS AT 22 APRIL 1992

1 Epimedium collection.
2 Koelreuteria paniculata (Sapindaceae) in young (pink) growth.
3 Alyssum saxatile (Cruciferae). C & E Europe.
4 Jasminum mesnyi (Oleaceae). W China.
5 Poncirus trifoliata (Rutaceae). China & Korea. A thorny relative of Citrus
6 Thermopsis caroliniana (Leguminosae). N America.
7 Pieris formosa var.forrestii 'Wakehurst' (Ericaceae). China.
8 Iris 'Bourne Graceful' (Iridaceae). Garden hybrid.
9 Paulownia lilacina (Scrophulariaceae). China ('Foxglove Tree')
10 Rosa 'Canary Bird' (Rosaceae). Garden origin.
11 Smyrnium perfoliatum (Umbelliferae) ('Alexanders')
12 Petteria ramentacea (Leguminosae). Yugoslavia.
13 Paeonia lutea var.ludlowii (Paeoniaceae). Tibet.
14 Paeony border - herbaceous and tree paeony varieties.
15 Ceanothus arboreus 'Mist' (Rhamnaceae). Seedling found at this garden.
16 Beschorneria yuccoides (Agavaceae). Mexico.
17 Caltha palustris var.polypetala (Ranunculaceae). S W Asia.
18 Orontium aquaticum (Araceae). USA.
19 Smyrnium olusatum (Umbelliferae). Europe inc.Britain.
20 Staphylea x coulombieri (Staphyleaceae). Caucasus.
21 Rosa 'Miss Lowe' (a China rose cultivar).
22 Asphodelus aestivus (Liliaceae). S Europe.
23 Tulipa clusiana (Liliaceae). Iran to Himalayas.
24 Rhododendron 'Amoenum' (Ericaceae). Japan. Introduced by Robert Fortune, Curator here 1846-1848.
25 Stylophorum diphyllum (Papaveraceae). N America.
26 Haberlea rhodopensis 'Virginalis' (Gesneriaceae). Greece.
27 Coronilla valentina ssp.glauca (Leguminosae). S Europe.
28 Clianthus puniceus (Leguminosae). New Zealand. Endangered in the wild ('Lobster's Claw').
29 Drimys lanceolata (Winteraceae). Australia.
30 Cydonia oblonga (Rosaceae) ('Quince')
31 Helianthemum ledifolium (Cistaceae). S Europe.
32 Geum pyrenaicum (Roseaceae). Pyrenees.
33 Iris 'Green Spot' (Iridaceae).
34 CONSERVATORY DISPLAY ON 'PLANTS IN DANGER' (FURTHER DISPLAY IN TEA ROOM)
35 Melianthus major (Melianthaceae). S Africa.
36 Rosa banksiae 'Lutea' (Rosaceae). China. Introduced 1824.
37 Sophora microphylla (Leguminosae). The New Zealand 'Kowhai'.
38 Viburnum macrocephalum (Caprifoliaceae). China.
39 Armoracia rusticana (Cruciferae) 'Horseradish'. S Europe.
40 Buddleia officinalis (strongly scented) and Mandragora officinarum (Solanaceae) 'Mandrake' - in fruit.
41 Podophyllum hexandrum (Berberidaceae), starting point for the manufacture of 'Etopside' an anti-cancer drug.
42 Cercis siliquastrum (Leguminosae) ('Judas Tree'). S Europe. The tree on which Judas Iscariot, by tradition, hanged himself.
43 Iris florentina (Iridaceae). Italy. some of 'orris' powder used in perfumery.
44 Kennedia nigricans (Leguminosae). Australia.
45 Acacia podalyriifolia (Leguminosae). Queensland, Australia.
46 Acokanthera oblongifolia (Apocynaceae). SW Africa, a source of arrow poison.

PLANTS IN DANGER!

Island plants threatened with extinction

Introduction

This display illustrates the conservation problems which affect plants growing on specific islands of the world. Island plants are often unique because of their isolation from outside evolutionary pressures over a long period of time.

Vulnerability of endemic species

The plants under threat are often types that are naturally only found on the island (called endemic species). Such species may have developed on the island or may be relics of formerly widespread species which have died out elsewhere. They are particularly vulnerable to grazing from introduced animals and competition from introduced plants, because they have often evolved without having to face outside pressures or severe competition.

The scale of the problem

On a world scale it is estimated that the survival of as many as 60,000 plant species out of a total of around 250,000 could be threatened by the year 2050 if present trends continue. Many of these plants are island endemics.

Why do plants need to be conserved?

Usefulness of plants

We use plants in every field of life from food to clothing, in building and in medicines. Plants provide the life support system for the earth by trapping the sun's energy and converting it into plant tissue, this then becomes the food for animals, including humans.

Dependence of animals on plants

The evolution of plants and animals has gone hand in hand, in many cases a species of animal may be dependent on one type of plant.

Dependence of humans on plants

People presently depend on only 20 plant species to provide over 85% of their food. Many other plants have never been examined for useful products and their potential as commercial crops has not been explored.

Use of plants for medicines

In most developing countries medical treatment is largely based on medicinal plants. Countless species of plants are becoming extinct before their potential to provide cures as medicine has even begun to be examined.

Undiscovered plants

Thousands of species have not yet been given a name or described scientifically, and we are, therefore, ignorant of the value they may have to humankind. We have a responsibility to future generations to conserve the biodiversity of our planet.

It is not only plants growing on islands which are under threat; there are conservation problems in many areas of the world.

Not very long ago the plant world seemed inexhaustible, always reasonably renewable. Today it is all too clear it is not.

What you can do

Britain is an island too. We have many plants threatened with national extinction for various reasons ranging from plants being dug up by collectors to habitat destruction and damage, often through changes in agricultural practices. Everyone must be prepared to take action now if we are to prevent more species from becoming extinct.

* Do not buy bulbs dug up from the wild - check the packet.
* Avoid using peat and use a substitute such as coir compost.
* Help protect your local wildlife habitats.
* Help by joining the appropriate organisations such as your local County Trust and those active in conservation worldwide.

What you can do in your garden

Almost 600,000 hectares of land in Britain is in private gardens (this is an area roughly the size of Devon). These gardens are important in providing food, water and shelter for birds and other wildlife, and are often a diverse habitat for many species. You can help Britain's wildlife by how you maintain your garden.

* Use organic gardening methods and avoid using chemicals i.e. pesticides.
* Start a compost heap and recycle organic household waste.
* Plant native trees and shrubs in your garden.
* Try to learn what animal species visit your garden and observe what plant species they find useful for food and shelter.
* Increase your knowledge of environmental issues, see the leaflet 'Wake up to what you can do for the environment'.
* Think Green!

If we all carried out some of these activities we are more likely to be giving future generations an environment fit to live in.

TEXT BOUND INTO THE SPINE

ON THE ROAD

Cars and lorries cause air pollution through exhaust fumes. The carbon dioxide they produce contributes to global warming.

You can help by getting more miles to the gallon. This will save you money and reduce the amount of harmful substances being pumped into the atmosphere.

The Government is working to control exhaust emissions, and the roadbuilding programme will cut pollution by reducing congestion.

If you or your family use a car you could reduce air pollution - and at the same time save money - if you

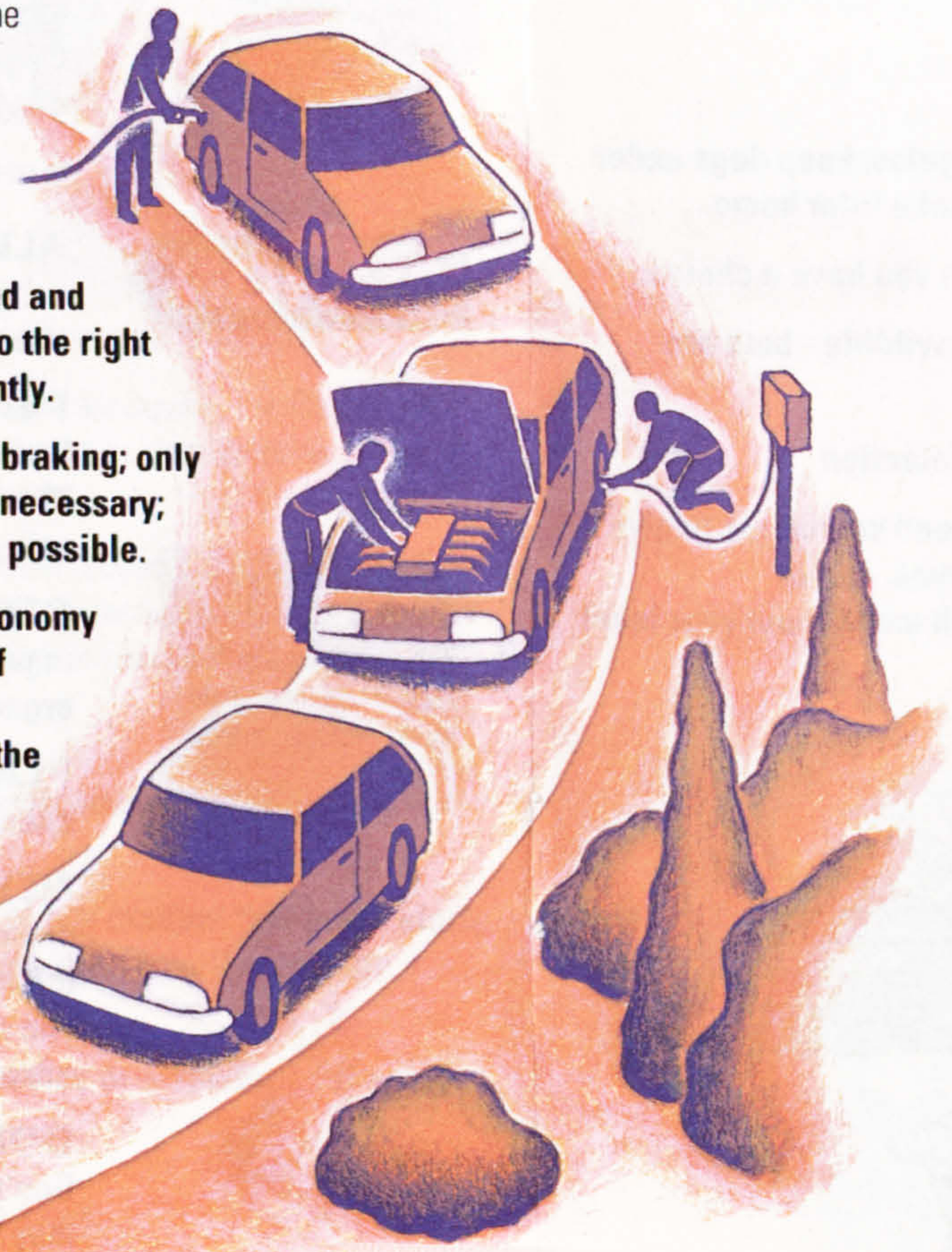
ACTION

USE unleaded petrol if your car can take it - remember it is cheaper as well as cleaner!

KEEP the engine properly tuned and serviced and the tyres inflated to the right pressure so the car runs efficiently.

AVOID fast starts and sudden braking; only use the choke when absolutely necessary; and use the higher gears where possible.

TAKE ACCOUNT of fuel economy when choosing a new car and if possible choose one with a catalytic converter to clean up the exhaust.



FACT

In the last three years unleaded petrol sales have risen from virtually nil to almost 40% of all petrol sold in the UK.

FACT

Cars travelling at 70mph can use up to 30% more fuel than those going at 50mph; driving any faster is illegal.

ACTION

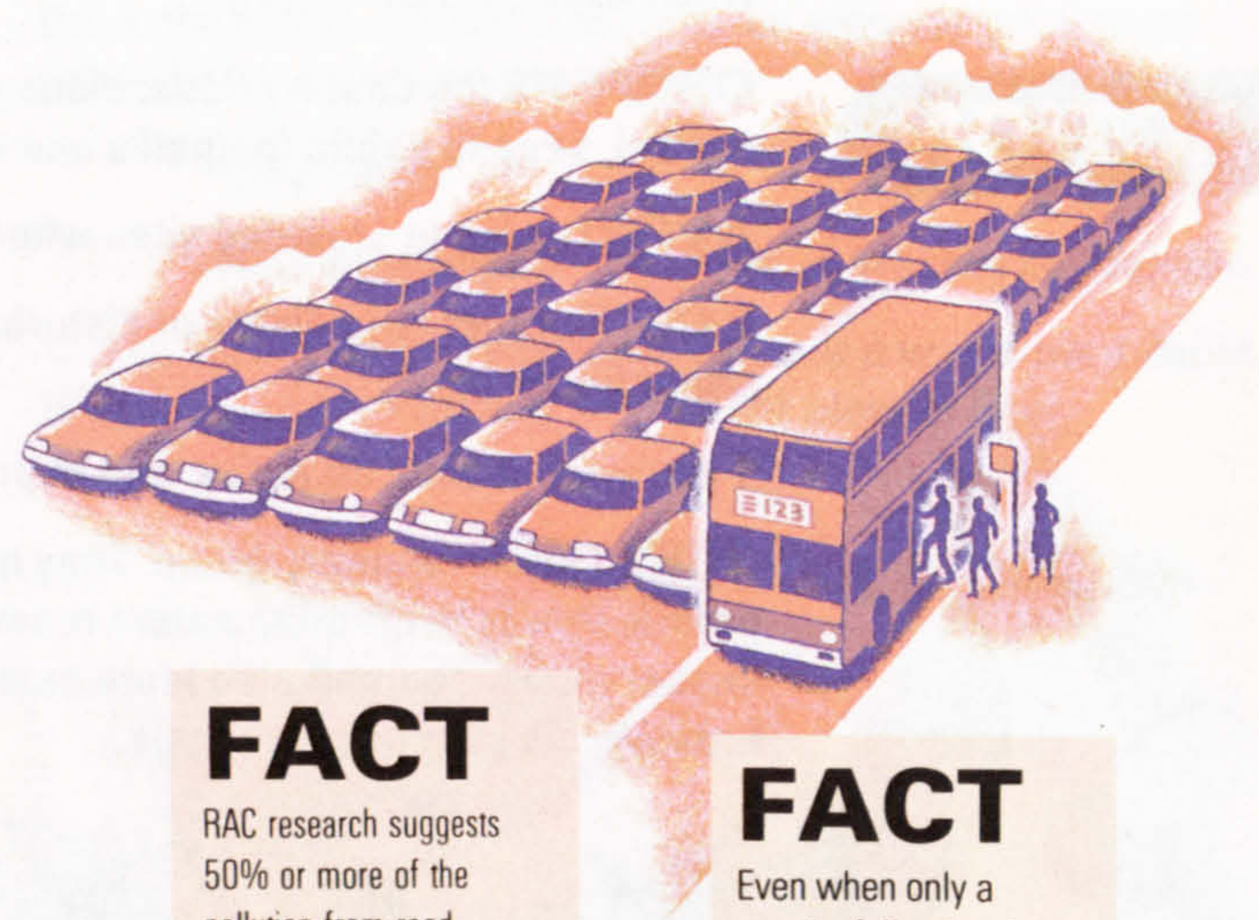
If you want to do something further, you can

WALK, or cycle where it is safe to do so - walking is free, cycling can help to keep you fit.

USE public transport whenever you can - using public transport reduces congestion.

SEND your waste oil, old batteries and used tyres to a garage or local authority site for recycling or safe disposal; all these can cause serious pollution.

NEVER pour used oil down the drain or into the ground.



FACT

RAC research suggests 50% or more of the pollution from road vehicles comes from less than 17% of all vehicles. 1% of vehicles generate as much pollution as the cleanest 40%.

FACT

Even when only a quarter full, a bus is more than twice as fuel efficient as a family car.

Appendix 3

295

IN THE COUNTRYSIDE

FACT
In the past two years volunteers working with the British Trust for Conservation Volunteers have planted over three quarters of a million trees.

This country has more than 30,000 species of animals and 5,000 species of wild plants. Some of these, including owls and bats, are under threat. We need to protect our own native species from extinction and to preserve their habitats.

Most of our countryside is man-made through farming. The Government helps farmers to protect the countryside in various ways. If you enjoy using the countryside, make sure that you do not damage it. Careless visitors can damage crops and frighten farm animals, or even endanger animals' lives by leaving litter such as plastic bags which they may eat.

When visiting the countryside

ACTION

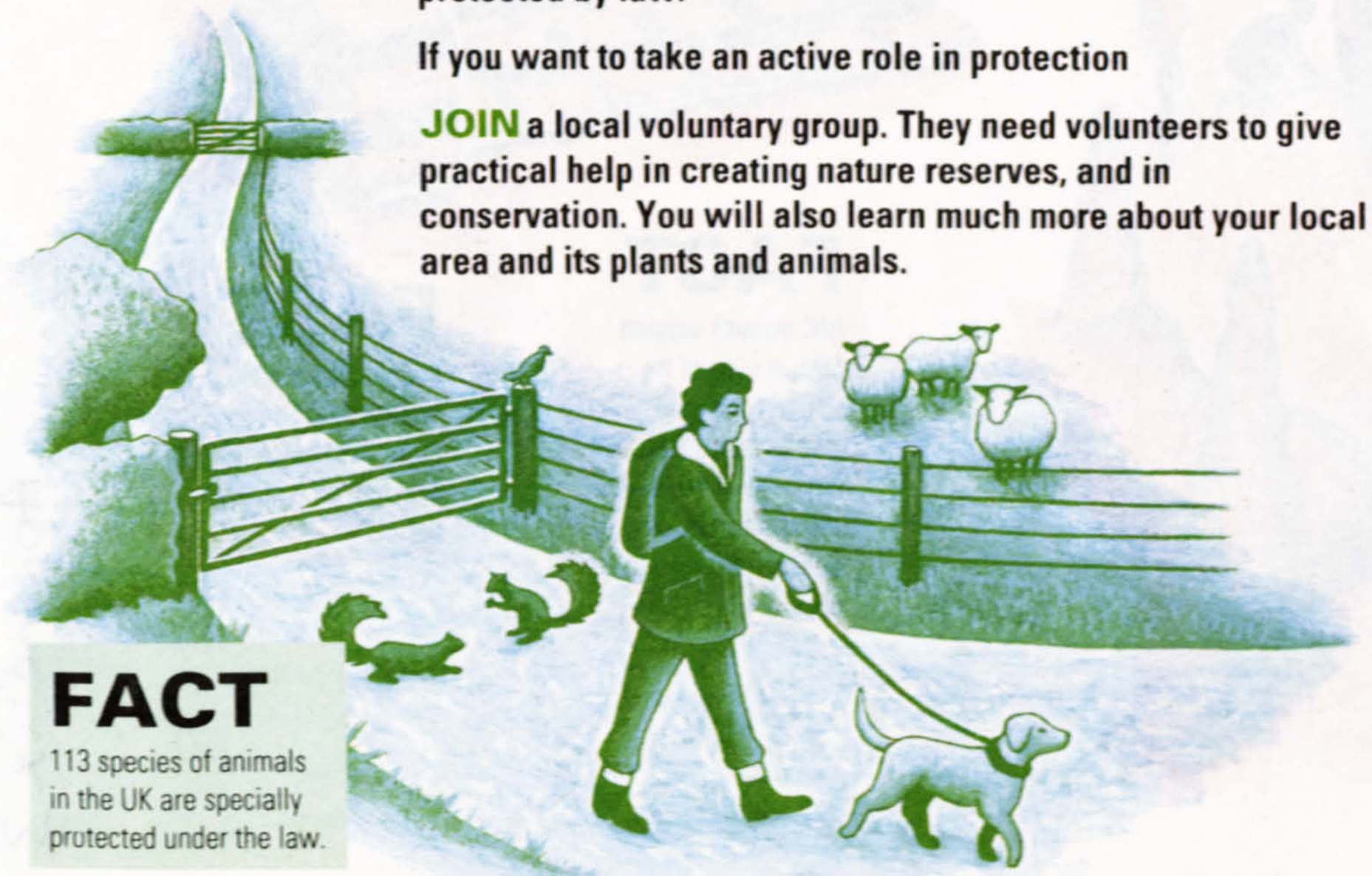
OBSERVE the Country Code: close gates, keep dogs under control, keep to public footpaths and take litter home.

AVOID going to crowded sites when you have a choice.

DON'T uproot wild plants or disturb wildlife - both are protected by law.

If you want to take an active role in protection

JOIN a local voluntary group. They need volunteers to give practical help in creating nature reserves, and in conservation. You will also learn much more about your local area and its plants and animals.



FACT
113 species of animals in the UK are specially protected under the law.

IN THE GARDEN

FACT
Private gardens in Britain cover an area larger than Somerset.

Private gardens account for about 600,000 hectares of land in Britain. They are important in providing food, water and shelter for birds and other wildlife whose natural habitat has been reduced through changes in the countryside.

Many people use garden chemicals. You can help guard against pollution by using them sparingly and by disposing of them properly. Alternatively you could try using organic methods and avoid using chemicals.

In managing your garden

ACTION

ALWAYS follow the manufacturer's instructions when using chemicals such as fertilisers and weedkillers. Store chemicals carefully, and don't buy more than you need.

PEAT is extracted from lowland bogs and supplies are limited. Avoid using peat wherever substitutes are available. Manure or other bulk conditioners can be used to improve th soil.

FACT
25% of people say they recycle their household waste through compost heaps.

START a compost heap, if you can: this can be used to improve the soil and will enable you to recycle much of your organic household waste.

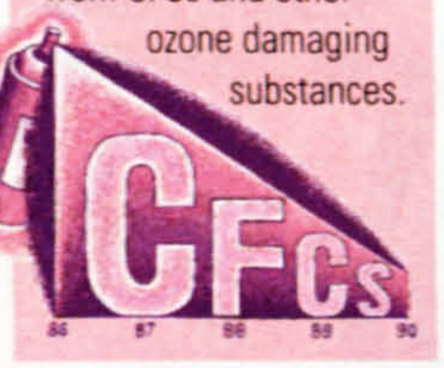
PLANT trees if you have room. They will help to absorb excess carbon dioxide.

NEVER put any left over chemicals (including concentrate chemicals or oil) down the drain, down the toilet, or dump them on the ground or in water, or burn them in the garden. I you do it will cause pollution. Contact your local authority fo advice on disposal.

DON'T burn anything but woody garden waste on bonfires Don't burn any other waste, especially plastics: the smoke may contain polluting gases. Don't start a bonfire where it

FACT

As a result of consumer pressure, 90% of aerosols are now free from CFCs and other ozone damaging substances.



As a shopper you can help to protect the environment through your spending decisions. Manufacturers are responding more and more to pressure from the public for products which are less harmful to the environment.

All manufactured products have *some* effect on the environment.

For example:

- the manufacturing process, or the product itself, may be polluting or use a lot of energy;
- there might be too much packaging, adding to waste and fuel costs for distribution;
- disposal after use may cause environmental problems.

To help you know more about what you are buying, the Government is developing an official labelling scheme to identify those products which do less harm to the environment.

This leaflet cannot advise on individual products. There are several books and magazines which provide information on specific products, and many shops produce leaflets on their own products.

When you shop

ACTION

FIND OUT more about the environmental effect of any product before you buy.

WRITE TO the manufacturer of any product that particularly concerns you. Writing takes time but it's well worth the trouble.

AVOID products with unnecessary or wasteful packaging.

REUSE carrier bags.

REFUSE unnecessary plastic bags.

FACT

More men are prosecuted for dropping litter than women.

Obviously, the best thing to do about litter is not to drop it in the first place. You can also help by picking up existing litter.

The Government is introducing new laws to deal with littering:

- the maximum fine for littering is going up, from £400 to £1000;
- local authorities will be able to make some kinds of shops (like take-away restaurants) keep the area in front of the shops tidy;
- for the first time, local authorities, government departments, schools and colleges and some other organisations will have a duty to keep their land litter-free. If they fail in this people will be able to take them to court.

But, in the end, the answer is to persuade everyone that littering makes for an unpleasant environment.

ACTION

DON'T drop litter!

HELP voluntary groups in your area with clean up projects.

IF you have a shop or business, sponsor a waste bin outside the premises to help keep your street clear of litter.

NOISE

Don't underestimate the harmful effects of noise. It is the form of pollution which has the most immediate effect on people. It can cause severe stress.

ACTION

DON'T disturb others with your noise.

IF you are bothered by noise and cannot resolve the problem, get in touch with your local authority Environmental Health Officer. Or, if the EHO is not available, call the police.

IF you are persistently disturbed by unnecessary noise, and the local authority is unable to help, in the last resort you have the right to apply to the magistrates' court for a court order for the noise to be stopped.

DOGS

Most dog owners control their pets, but some don't. Uncontrolled dogs can stray and foul the pavements and open spaces. Young children can pick up an infection from dog faeces which can lead to blindness. Attacks by uncontrolled dangerous dogs can threaten lives.

ACTION

MAKE SURE your dog wears a collar and identification tag; the law requires it. Keep it under control in public areas and don't let it stray.

DON'T allow it to foul pavements or public spaces - especially play areas - get a poop scoop from a pet shop.

DON'T let your dog make a noise that can annoy

RECYCLING

FACT

More than half the paper and cardboard manufactured in the UK is made from recycled paper.

FACT

Producing an aluminium can from recycled material takes one twentieth of the energy needed to produce a can from raw materials.

We all produce household waste, and most of this is buried on land. About **half** this waste could be usefully recycled. Recycling reduces the waste of raw materials, and less energy is needed to produce new goods. Local authorities are now required to provide recycling facilities.

FACT

The amount of glass recycled in the UK has increased by more than ten times in the last ten years.

ACTION

MAKE USE OF the many collection points for glass, paper, metals and other materials which are often found in supermarket car parks and rubbish tips. If you don't know where they are, ask your local authority.

RECYCLE waste food into compost for your garden.

CHOOSE goods which can be recycled.

ENCOURAGE your workplace or school to recycle its waste and to use recycled products.

BUY recycled products: this will encourage manufacturers to supply them.

SUPPORT local recycling services run by voluntary groups and charities.

DISPOSE of an old fridge or freezer by taking it to a CFC recycling centre: your local authority

IN THE HOME

ACTION

You can help tackle global warming and acid rain by using energy more efficiently in your home. This will reduce the amount of harmful gases produced in power generation. It will also **save you money.** You can cut energy bills by up to a fifth with relatively little outlay.

You can

- **INSULATE your walls - the largest area of heat loss. This is the most important thing to do if you have cavity walls. Saving: £60-£80*.**
- **TOP UP your loft insulation with another 4-6 inches. Saving: £50-£60*.**
- **USE thermostats and timers on heating systems; keep the thermostat as low as is comfortable. Saving: £15-£30* for a 1°C reduction.**
- **DRAUGHT PROOF doors and windows. Saving: £20-£30*.**
- **CHOOSE energy-efficient fridges, freezers, dishwashers etc. Saving: up to £20* for a fridge freezer.**
- **USE low-energy light bulbs. Although they cost more to buy they use less energy and last longer, so they are much cheaper in the longer run. Saving: up to £8* per light bulb.**
- **ONLY heat the water when you need it - it is NOT cheaper to leave it on all the time.**
- **TURN OFF unused lights and appliances, especially televisions - it is NOT more expensive to constantly turn lights on and off.**
- **FIT an energy efficient condensing boiler when buying or replacing a gas-fired central heating boiler. Saving: £40-£80*.**

FACT

Almost 3 tonnes of carbon dioxide are generated per person in the UK each year.

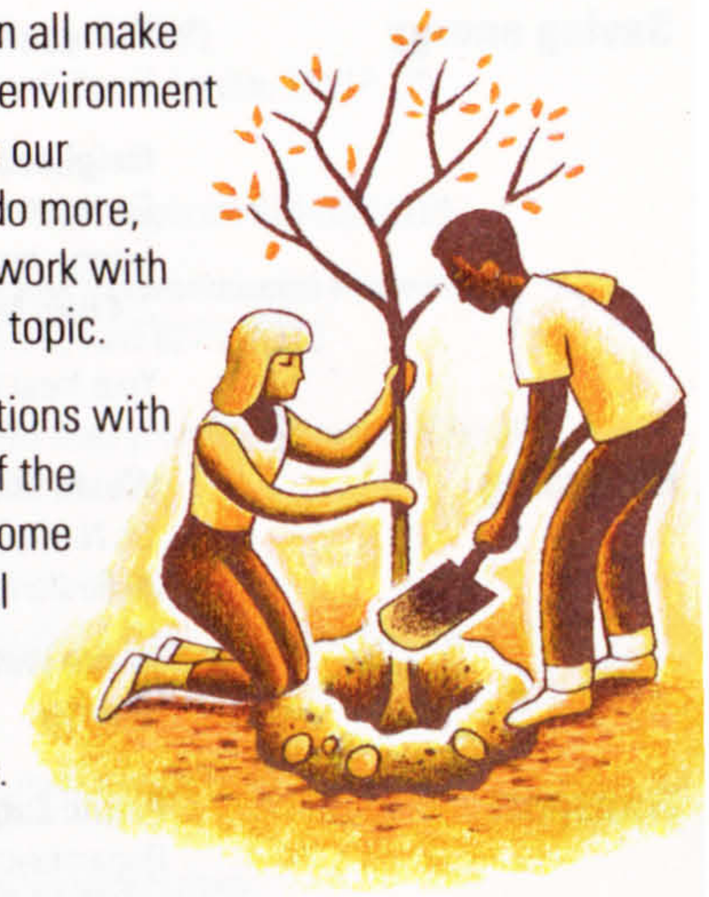
* estimated savings per year all based on average size gas-heated semi-detached house: capital costs not included.

ONE STEP FURTHER

FACT

Membership of some environmental voluntary groups has increased by over 50% since 1980.

This leaflet explains how we can all make a contribution to protecting the environment just by making small changes in our daily behaviour. If you want to do more, you can join or form a group to work with others on a particular project or topic.



There are hundreds of organisations with an interest in various aspects of the environment which would welcome your support. At a national level they cover the whole spectrum of interests. There are also many regional and local groups.

By joining a group you could

ACTION

- **INCREASE your knowledge of environmental issues.**
- **GET INVOLVED in practical work such as conservation or restoration of a local site.**
- **HELP persuade other organisations and individuals to act responsibly. If you are already involved in voluntary work, see whether there is any action your organisation can take itself to act in a more environmentally aware way.**

FACT

Over 40,000 children and 175,000 adults worked on Groundwork projects to restore local sites last year.

If you are particularly keen to take an active part, you or your voluntary group can help in monitoring pollution in a number of ways:

- **ALERT the National Rivers Authority (NRA) to any cases of suspected pollution of rivers, or the local authority about air or land pollution.**
- **TELL your regional traffic area office (for the number see the telephone directory) of the registration numbers of unacceptably smoky vehicles.**
- **CHECK environmental information registers held by HMIP, NRA and local authorities, which will tell you about releases from factories and other sites into the environment.**

FURTHER INFORMATION

Saving energy

Energy Efficiency Office
Eland House, Stag Place, London SW1E 5DH

Neighbourhood Energy Action
For information on domestic energy efficiency, particularly assistance for low income households.
2/4 Bigg Market, Newcastle upon Tyne NE1 1UW, Telephone 091-261 5677

Your local electricity and gas suppliers.

Recycling

Waste Watch
c/o National Council for Voluntary Organisations
26 Bedford Square, London WC1B 3HU

Waste Watch is the national agency for the promotion of community recycling schemes.

Transport

Public Enquiry Unit
Department of Transport, 2 Marsham Street, London SW1P 3EB

RAC
Public Policy Division, RAC Motoring Services, RAC House, M1 Cross, London NW2 1LT, Telephone 021-430 7392

AA
Farnum House, Basingstoke RGL1 2EA, Telephone 0345 500600

Gardening

The Henry Doubleday Research Association
National Centre for Organic Gardening, Ryton-on-Dunsmore, Coventry CV8 3LG, Telephone 0203 639299

The countryside

The Countryside Commission
John Dower House, Crescent Place, Cheltenham, Gloucestershire GL50 3RA, Telephone 0242 521381

The Nature Conservancy Council for England
Northminster House, Peterborough PE1 1UA, Telephone 0733 40345

RSNC: The Wildlife Trusts Partnership
The Lodge, Sandy, Bedfordshire SG12 2DL, Telephone 0767 680551
RSNC represents your local Wildlife Group and WATCH, the young environmentalist club.

The Government recently set out its plans for the environment in a White Paper called *This Common Inheritance* which you can get from libraries or bookshops. It describes some of the problems facing the world's environment including:

- the rate at which we are using up limited natural resources
- the growing amount of waste
- the 'greenhouse effect' which could mean changes in the world climate
- the thinning of the ozone layer
- air pollution
- water pollution

Many people are also worried about local environmental problems such as noise and litter.

YOU can help tackle all these problems - Yes, **all** of them. The Government has set out an action plan in the White Paper, and is implementing it. But Governments cannot solve the problem alone. Everyone's help is needed to contribute to the solution.

Simple measures like reducing household waste, improving loft insulation and even making sure your car is properly tuned can all help.

So - **WAKE UP** to what you can do!

The ozone layer
Ultra-violet radiation from the sun can cause skin cancer and eye disorders, and damage crops. A layer in the atmosphere a hundred miles from earth stops most of the ultra-violet radiation from reaching the earth. Some man-made chemicals (mostly CFCs) used in aerosols and fridges have been destroying the ozone layer. Governments have agreed to phase out production of CFCs over the next few years.

Air pollution
Power stations and other industry, cars and other vehicles all produce harmful gases such as sulphur dioxide and nitrogen dioxide. If concentrations of these gases build up they can cause discomfort or even be a health risk. And when they dissolve in water vapour and fall to earth as 'acid rain', they can kill fish in lakes and damage plants, animals and buildings.

Pollution of rivers, lakes, beaches, drinking water
Pollutants get into water through the drains and other discharges. The water industry is investing billions of pounds in cleaning up our water and preventing further pollution.

This leaflet offers some simple advice about practical steps **YOU** could take to protect or improve the environment.

You may think one person acting alone can't do much, but if we **all** do something there will be a big impact. **And if we don't** - some of the problems will get **worse.**

WHAT ARE THE PROBLEMS?

Using up natural resources and the increasing level of waste

Tropical and other forests are disappearing; land is being badly cultivated; many species of animals and plants are being lost; deserts are spreading. Coal, oil and gas are being used up. Increased consumption generates more waste which in turn causes disposal problems. We need to manage natural resources better, and to waste less.

The greenhouse effect and climate change

Carbon dioxide and other gases are produced in ever increasing quantities: - from burning fossil fuels to make electricity, from vehicles, from industrial processes.

Some of these gases are building up in the atmosphere and are trapping more of the sun's heat than before. As a result, the world may get hotter. This may lead to changes in climate and risks of drought and flooding. We need to be more efficient in our use of energy so as to reduce CO_2 emissions.

Pollution control	**Her Majesty's Inspectorate of Pollution (HMIP)** Room A136, Romney House, 43 Marsham Street, London SW1P 3PY
	National Rivers Authority 30-34 Albert Embankment, London SE1 7TL, Telephone 071-820 0101
	The National Society for Clean Air and Environmental Protection 136 North Street, Brighton BN1 1RG, Telephone 0273 26313
Noise	DOE booklet *Bothered by noise* available from your local library or Citizen's Advice Bureau.
Dogs	**RSPCA** The Causeway, Horsham, West Sussex RH12 1HG, Telephone 0403 641 81
Litter	**The Tidy Britain Group** The Pier, Wigan WN3 4EX, Telephone 0942 824620
Voluntary work	**The National Council for Voluntary Organisations** The Information and Intelligence Unit, 26 Bedford Square, London WC1B 3HU, Telephone 071-636 4066
	Groundwork Bennetts Court, 6 Bennetts Hill, Birmingham B2 5ST, Telephone 021-236 8565
General information	**The Consumers' Association** 2 Marylebone Road, London, NW1 4DX: energy efficient appliances, product information, gardening.
	Friends of the Earth 26-28 Underwood Street, London N1 7JQ *Ask for their publications list.*
Local authority	Your District, Metropolitan or County Council: energy saving grants, recycling, local pollution consent registers, litter, noise.

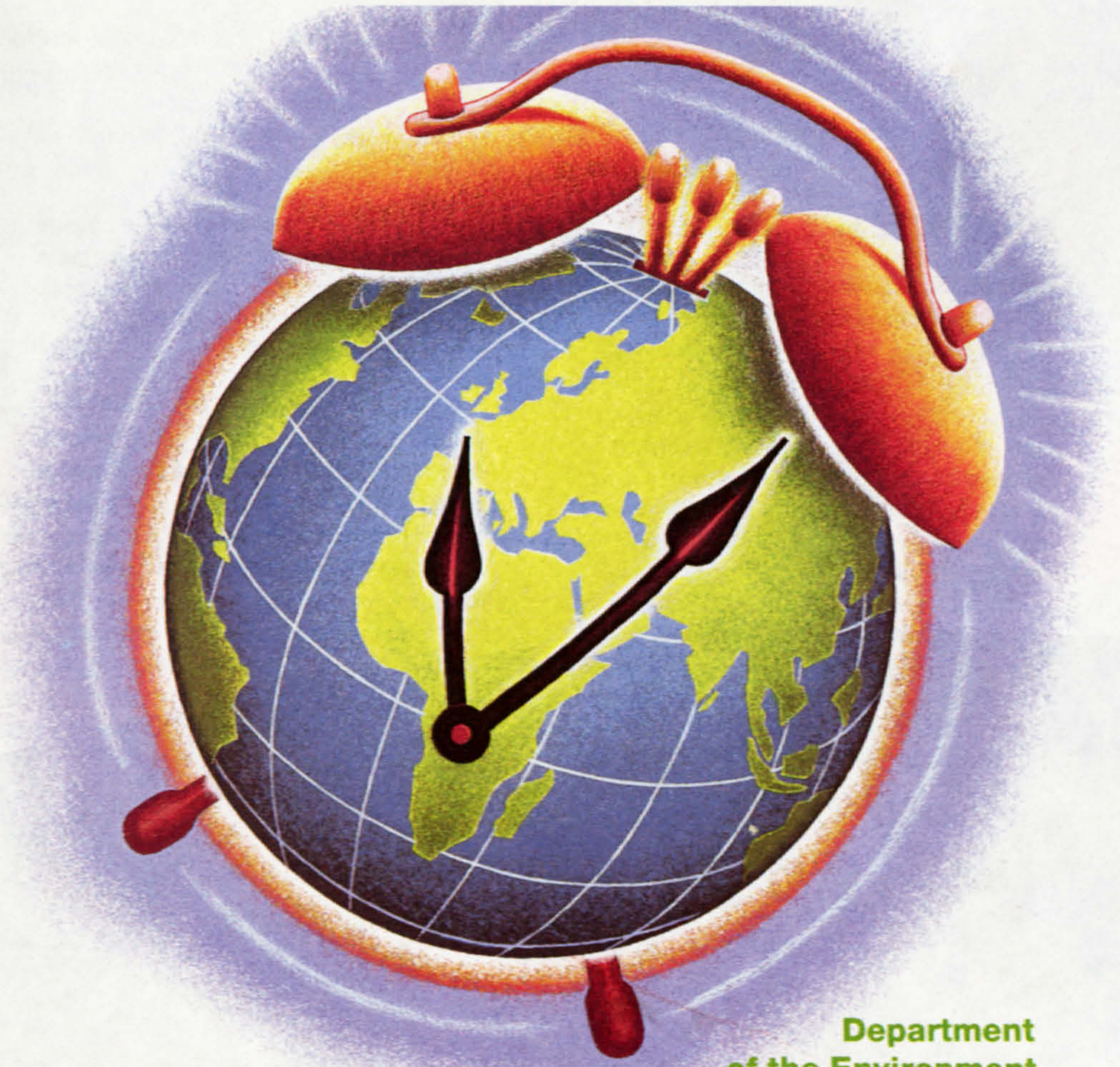
Further information on specific environmental questions may be obtained from: Douglas Matthews, **Department of the Environment,** Room A302, Romney House, 43 Marsham Street, London SW1P 3PY.

Published by The Department of the Environment
Printed in Great Britain on recycled paper: 83 B/17 C

90 ENV 42

WAKE UP

TO WHAT YOU CAN DO FOR THE ENVIRONMENT



Department of the Environment

Prunus africana
This bark, collected from trees in the wild, is being exported to France to be used in the treatment of enlarged prostrate glands.

Hibiscus insularis
There are only four plants of this species left in the wild on Philip Island, grazed almost to extinction by introduced goats.

Crinum mauritianum
A beautiful plant growing on the edge of a reservoir threatened by flooding.

Gran Canaria and Madagascar
When trees are removed erosion rapidly takes place seen here on the Canary Islands and Madagascar.

Competition from introduced plants
A single tree of Sideroxylon cinereum (sessiliflorum)? surrounded by introduced privet and guava plants.

Clianthus formosus.
Relative of the threatened Clianthus puniceus

Mauritius
Extensive cultivation has reduced the laurel forest to small areas.

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This bark, collected from trees in the wild, is being exported to France to be used in the treatment of enlarged prostrate glands.

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Clianthus formosus.
Relative of the threatened Clianthus puniceus

Mauritius
Extensive cultivation has reduced the laurel forest to small areas.

Appendix 5a

CHELSEA PHYSIC GARDEN

EXIT QUESTIONNAIRE

[Ref code:]

The staff of Chelsea Physic Garden are very keen to learn about our visitors. In particular why they come to the Garden, what they know about the Garden and learn from a visit, in order to improve the information given in the Garden. We would be very grateful if you could take the time to fill in this short questionnaire before you leave the Garden. In return we can give you a free historical leaflet.

Please answer the questions in order by ticking the appropriate answer or filling in the gaps. The results of this questionnaire will be treated in strict confidence and will only be used as part of the research study.

---

1. Please indicate your age group as this gives us an idea of our visitors.
   15-20[] 21-30[] 31-40[] 41-50[] 51-60[] 60+[]

2. Are you?- MALE[] FEMALE[]

3. How many times have you visited Chelsea Physic Garden before today?
   NEVER[] ONCE[] TWICE[] MORE THAN TWICE[]

4. Have you come:
   ALONE[] WITH FRIENDS[] WITH FAMILY[] WITH AN ORGANISED GROUP[]
   OTHER please state_____

5. a) Have you visited any other gardens open to the public this year?
   YES[] NO[]

   b) If you have, which were they? (please name no more than two)
   _____ _____

6. How did you hear about Chelsea Physic Garden?
   (tick all those that are approp.)
   ADVERTISEMENT[] which_____
   _____RECOMMENDATION[]
   OTHER[] please state_____

7. Where do you live?
   TOWN_____
   COUNTRY_____

8. Where have you travelled from today?
   HOME[]
   OTHER (name town)_____

9. How have you travelled here? (tick as appropriate)
   CAR[] BUS[] TRAIN[] TUBE[] FOOT[] OTHER please state_____

10. Does your programme today involve visits to any other places?
    YES[] NO[]
    Please name one_____

11. Which of the interests listed on the right describes your main reason for visiting the Garden?
    GARDENING[] BOTANY[]
    PLEASURE[] MEDICAL[]
    HISTORICAL[] HERBS[]
    OTHER please give reason_____

12. Chelsea Physic Garden, like Kew, is a Botanic Garden. What makes a Botanic Garden different from other gardens?
    _____
    _____

13. What, do you think, are the reasons for having Botanic Gardens?
    _____

14. What are the reasons which might be given for conserving plant species?

15a. Can you name any particular plant species needing protecting or conserving? If so, please name two.

b. Why do those plant species need protection?

16. What might you be able to do to help conserve plants and the environment?

17. Which of the following do you believe are the three most important issues facing us in the world today.
(Please indicate
1- most important
2- 2nd most important
3- 3rd most important
in the appropriate box)

(1- most important, 3- 3rd most important)

POVERTY[] OVERPOPULATION[]
ACID RAIN[] EUROPEAN UNION[]
POLLUTION[] LACK OF HOUSING[]
THREAT OF NUCLEAR WAR[]
WORLD ECONOMIC INSTABILITY[]
ENVIRONMENTAL DESTRUCTION[]
WORLD HUNGER[]
Other please indicate_____

18. Please tell me whether you agree strongly(1), agree(2), have no opinion(3), disagree(4), strongly disagree(5) with these statements below. (Please circle the appropriate answer).

	AGREE STRONG	AGREE	NO OPIN	DISAG	DISAG STRONG
My own personal actions accelerate the rate of rain forest destruction.	1	2	3	4	5
Some small islands should be 'out of bounds' to visitors -including me.	1	2	3	4	5
If I buy artificially propagated bulbs it will help conserve the numbers growing in the wild.	1	2	3	4	5
Cutting down the amount of waste I produce will help conserve the environment.	1	2	3	4	5
There is nothing I can do to change the hole in the ozone layer.	1	2	3	4	5
I should buy furniture made from tropical hardwoods.	1	2	3	4	5
I should use natural products as pesticides in my garden.	1	2	3	4	5
If I grow native plant species in my garden it will help conserve wildlife.	1	2	3	4	5
I should be able to buy peat for use in my garden.	1	2	3	4	5

19. Do you grow plants in the- (tick all that are appropriate)

HOUSE[] GARDEN[]
PATIO[] WINDOW BOX[]
DON'T GROW PLANTS[]
OTHER please give details _____

20a. Do you grow any species native to the country you live in?

YES[] name up to 2 _____
DON'T KNOW[] NO[]

b. Do you maintain any part of your garden particularly for wildlife?

YES[] NO[]
DON'T KNOW[] NO GARDEN[]

21. Do you make compost from plant waste?

YES[] NO[]

b. If NO is there a reason why not? _____

22. Approximately how long have you spent in the Garden today?

LESS THAN 30MINS[] 30MIN-1HR[]
1HR-1.5HRS[] MORE THAN 1.5HRS[]

23. Which part of the Garden most interested you? _____

b. Why did it interest you? _____

24. Was there anything about the Garden which you found disappointing? _____

25. Was there anything you would have liked further information on? _____

26a. Did you look at the information on island plants in the conservatory?

YES[] NO[]

b. Was there anything which particularly interested you in the display? _____

27. Would you buy a coloured guidebook about the Garden if one were on sale?

YES[] NO[]

28. Would you be prepared to take part in a follow up interview?

YES[] NO[]
HERE[] IN YOUR OWN HOME[]

29. If so please leave your name, address, and telephone number _____

We should like to give our grateful thanks to you for spending the time to fill in this questionnaire. We hope you enjoyed your visit and will come again.

CHELSEA PHYSIC GARDEN

QUESTIONNAIRE

[Ref code:]

The staff of Chelsea Physic Garden are very keen to learn about our visitors. In particular why they come to the Garden, what they know about the Garden and learn from a visit, in order to improve the information given in the Garden. We would be very grateful if you could take the time to fill in this short questionnaire before you go round the Garden. In return we can give you a free 'points of interest' sheet.

Please answer the questions in order by ticking the appropriate answer or filling in the gaps. The results of this questionnaire will be treated in strict confidence and will only be used as part of the research study.

1. Please indicate your age group as this gives us an idea of our visitors.	15-20[] 21-30[] 31-40[] 41-50[] 51-60[] 60+[]
2. Are you?-	MALE[] FEMALE[]
3. How many times have you visited Chelsea Physic Garden before today?	NEVER[] ONCE[] TWICE[] MORE THAN TWICE[]
4. Have you come:	ALONE[] WITH FRIENDS[] WITH FAMILY[] WITH AN ORGANISED GROUP[] OTHER please state_____
5. a)Have you visited any other gardens open to the public this year?	YES[] NO[]
b)If you have, which were they? (please name no more than two)	_____ _____
6. How did you hear about Chelsea Physic Garden? (tick all those that are approp.)	ADVERTISEMENT[]which_____ _____RECOMMENDATION[] OTHER please state_____
7. Where do you live?	TOWN_____ COUNTRY_____
8. Where have you travelled from today?	HOME[] OTHER (name town)_____
9. How have you travelled here? (tick as appropriate)	CAR[] BUS[] TRAIN[] TUBE[] FOOT[] OTHER please state_____
10. Does your programme today involve visits to any other places?	YES[] NO[] Please name one_____
11. Which of the interests listed on the right describes your main reason for visiting the Garden?	GARDENING[] BOTANY[] PLEASURE[] MEDICAL[] HISTORICAL[] HERBS[] OTHER please give reason_____
12. Chelsea Physic Garden, like Kew, is a Botanic Garden. What makes a Botanic Garden different from other gardens?	
13. What, do you think, are the reasons for having Botanic Gardens?	

14..What are the reasons which might be given for conserving plant species?

15a.Can you name any particular plant species needing protecting or conserving? If so please name 2.

b.Why do those plant species need protection?

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(Please indicate
1- most important
2- 2nd most important
3- 3rd most important
in the appropriate box)

(1- most important, 3- 3rd most important)

POVERTY[ ] OVERPOPULATION[ ]
ACID RAIN[ ] EUROPEAN UNION[ ]
POLLUTION[ ] LACK OF HOUSING[ ]
THREAT OF NUCLEAR WAR[ ]
WORLD ECONOMIC INSTABILITY[ ]
ENVIRONMENTAL DESTRUCTION[ ]
WORLD HUNGER[ ]
Other please indicate( ) _____

18.Please tell me whether you agree strongly(1), agree(2), have no opinion(3), disagree(4), strongly disagree(5) with these statements below. (Please circle the appropriate answer).

	AGREE STRONG	AGREE	NO OPIN	DISAG	DISAG STRONG
My own personal actions accelerate the rate of rain forest destruction.	1	2	3	4	5
Some small islands should be 'out of bounds' to visitors - including me.	1	2	3	4	5
If I buy artificially propagated bulbs it will help conserve the numbers growing in the wild.	1	2	3	4	5
Cutting down the amount of waste I produce will help conserve the environment.	1	2	3	4	5
There is nothing that I can do to change the hole in the ozone layer.	1	2	3	4	5
I should buy furniture made from tropical hardwoods.	1	2	3	4	5
I should use natural products as pesticides in my garden.	1	2	3	4	5
If I grow native plant species in my garden it will help conserve wildlife.	1	2	3	4	5
I should be able to buy peat for use in my garden.	1	2	3	4	5

19. Do you grow plants in the- (tick all that are appropriate)	HOUSE[1] GARDEN[2] PATIO[3] WINDOW BOX[4] DON'T GROW PLANTS[5] OTHER(S)please give details _____
20a. Do you grow any plant species native to the country you live in?	YES[1] name up to 2_____ DON'T KNOW[2] NO[0]
b. Do you maintain any part of your garden particularly for wildlife?	YES[1] NO[0] DON'T KNOW[2] NO GARDEN[3]
21. Do you make compost from plant waste?	YES[1] NO[0] Garden too small ☺
b. If NO is there a reason why not?	_____
22. What do you hope to learn about in your visit today?	_____
23. From where do you expect to get this information?	_____

[ONLY ASK THIS IF BASED IN ENGLAND, LOCAL OR LIKELY TO COME AGAIN]

24. Would you be prepared to take part in a follow up interview?	YES[] NO[] HERE[] IN YOUR OWN HOME[]
25. If so please leave your name, address, and telephone number	_____ _____ _____

We should like to give our grateful thanks for your spending the time to fill in this questionnaire. We hope you enjoy your visit.

If you would like to comment on any of the displays in the Garden please use the space below.

- Appendix E

CHELSEA PHYSIC GARDEN POST VISIT QUESTIONNAIRE NO(

The staff at Chelsea Physic Garden are very keen to learn about our visitors. In particular we would like to know what you learn from a visit, in order to improve the displays and information given in the Garden.
We would be very grateful if you could take the time to fill in the enclosed questionnaire.

Please answer the questions in order as you come to them.

First I should like to ask you about your memories of your visit to the Garden.

1a. Thinking back to your visit when I spoke to you at Chelsea Physic Garden, what two things do you remember best about your visit?	_____ _____
1b. What, if anything, do you remember about the layout or structure of the Garden?	_____ _____
1c. What, if anything, do you remember about the information given in the Garden?	_____ _____
1c. What, if anything, do you remember about any horticultural advice given in the Garden?	_____ _____

We are trying to assess the value of temporary exhibits in the Garden; When you came we had an exhibit about Endangered Island Plants, in the conservatory off the tea room.

2a Did you visit the display on Endangered Island Plants in the conservatory off the tea room? (If no go to question 6)	YES[] NO[]
2b. Approximately how much information in the display did you read, including labels and text?	ALMOST ALL TEXT [] ALMOST ALL PLANT LABELS[] SOME PLANT LABELS[] SOME TEXT [] NONE[]

The next set of questions is about what you might recall from the display.

3a. Do you recall seeing any of the following plants?(please tick)	LEMON TREE[] ALOE VERA[] DOMBEYA MAURITIANA[] LIMONIUM REDIVIVUM[] ECHIUM WILDPRETII[] DRAGON TREE[]
3b. Can you recall any islands the plants in the display came from? If so please list them.	_____ _____
3c. What reasons can you recall for plants in the display being under threat?	_____ _____

4. Which of these did you spend most time on, in the display?

READING THE PLANT LABELS[]
READING THE TEXT[]
LOOKING AT THE PLANTS[]
LOOKING AT THE PICTURES[]

5. What, if anything can you recall about suggestions made in the display about the way the public could enhance conservation in their gardens?

_____

_____

6a. Did you take a copy of the booklet 'Wake up to what you can do for the environment'?

YES[] NO[]

6b. Do you still have a copy of the booklet?

YES[] NO[]

6c. Did you read it?

YES[] NO[]

6d. If you read it when did you read it?

IN THE GARDEN[] AT HOME[]
ON THE WAY HOME[] OTHER[]

7. If you read the booklet, what messages, if any, can you recall from it? (Please answer this question without looking at the booklet now!)

_____

_____

8. What changes, if any, have you made in the way you garden since reading the booklet or seeing the display?

_____

_____

9. Were these changes prompted by the booklet or display?

BOOKLET[] DISPLAY[]
BOTH[] NO CHANGES[]

10. Are there any changes you would like to make in your garden, which were prompted by the display, but but which you have not yet managed?

_____

_____

11. What has stopped you from making these changes?

_____

_____

Botanic Gardens are not the only source of information about conservation of endangered plants and gardening

12. Have you read or seen anything on television which has made any impression on the way you behave towards the environment and wildlife in your home and garden?

_____

_____

_____

13. Do you find advice on gardening that is 'friendly' to wildlife is consistent?

YES[] NO[]

14. If advice is not consistent between sources, please
a) give some examples of inconsistent advice.
b) say which source you think is more reliable, and why.

_____

_____

_____

PART B NO{ }

The Chelsea Physic Garden is interested in gaining more detailed information about how people garden in order to structure temporary displays in the Garden. We would be very grateful if you could answer the following questions about the way you garden.

---

1. What criteria do you use in choosing plants for your garden? e.g.size, colour of plant, suitability for area

2. How do you choose plants for your garden? e.g. consult nursery guide, ask nursery specialist, look in garden centre, visit other gardens?

3. When choosing a plant to grow do you take into account the value for wild-life of the plant?

OFTEN[]
SOMETIMES[]
RARELY[]
NEVER[]

4. Many gardeners try to preserve plants which have become rare in the wild or plants which have gone out of fashion Do you propagate any such plants?

YES[] NO[]

Name of plant for example

5. In your garden how do you control?

a) slugs
b) aphids
c) caterpillars

6. In your garden how do you control?

a) lawn weeds
b) weeds on paths
c) weeds in beds

7. What birds do you see in your garden?

8. Do you choose to grow plants specifically which provide food for birds?

YES[] NO[]

for example

9. What, if any, plants do birds use for nest sites in your garden?

10. Do you have a garden pond?

YES[] NO[]

10a. If so is your pond a breeding ground for frogs and toads in spring?

YES[] NO[]
DON'T KNOW[]

12 Approximately how large is your garden? (use any units length x width)

13. Chelsea Physic Garden is interested in mounting temporary exhibitions to do with gardening. Are there any themes related to home gardening you would be interested in seeing a display about?

We thank you for your help and hope you enjoyed your visit. If there are any other comments or suggestions you would like to make please use this space here.

Appendix 6c

Plants in Danger!

Island plants threatened with extinction

Plant portraits

Threats to the survival of plants

Crops

Grazing and introduced plants

Fire

Tourism

Habitat destruction

Removal of trees leading to erosion

Appendix
6b


BRITISH PLANTS IN DANGER
LABIATAE
DOWNY WOUNDWORT
STACHYS
GERMANICA

Appendix 7

QUESTIONNAIRE FOR

STUDLAND LEAFLET EVALUATION

Site: ___ _ _____ Date: _____ Questionnaire No:____

Time: __:__ __ . ___ Weather: _____ . _ Sex: M: ☐ F: ☐

Age Category: ☑ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60+

1. *IS THIS YOUR FIRST VISIT TO STUDLAND?*

   Yes ☐ No ☑

1a. *IF NO, HOW MANY VISITS DO YOU MAKE IN A YEAR?*

   1 2-5 visits per year ☐
   2 5-10 visits per year ☐
   3 More than 10 visits per year ☑

2. *HOW DID YOU TRAVEL HERE TODAY?*

   1 By public transport ☐
   2 Special bus/coach with organised group ☐
   3 By car/camper van ☐
   4 On foot (entirely) ☑
   5 In some other way (please specify .....

   .....

3. *IF YOU TRAVELLED BY CAR, WHERE DID YOU PARK?*

   .....

4. *WHERE DID YOU SET OUT FROM TODAY?*

   1 Nearest town ....
   2 County ....
   3 Country ....

5. *ABOUT HOW FAR AWAY IS THAT?*

   1 Under 5 miles
   2 5-14 miles
   3 15-24 miles
   4 25-49 miles
   5 50-74 miles
   6 75 miles or more

6. *DID YOU TRAVEL FROM YOUR HOME?*

   1 Yes
   2 No

7. *IF NO, WHERE IS YOUR HOME?*

   1 Nearest town .. ..
   2 County ....
   3 Country ....

8. *INCLUDING YOURSELF, HOW MANY PEOPLE ARE THERE IN YOUR PERSONAL GROUP?*

   1 Children (aged under 11) .....
   2 Children (aged 11-16) .....
   3 Adults ....

9. *APPROXIMATELY HOW LONG HAS YOUR VISIT LASTED SO FAR TODAY?*

   . . Hours . .. Minutes Page 1

10. *HOW LONG DO YOU INTEND TO STAY ALTOGETHER?*

..... Hours ..... Minutes

11. *WHO OWNS THIS BEACH?*

1 National Trust ☐
2 Private landowner ☐
3 National Park ☐
4 Countryside Commission ☐
5 Local/County Council ☐
6 English Nature ☐
7 Don't know ☐

12. *ARE YOU A NATIONAL TRUST MEMBER?*

Yes ☐ No ☐

13. *WHAT ACTIVITIES HAVE YOU UNDERTAKEN HERE TODAY?*

1 Sunbathing ☐
2 Swimming ☐
3 Walking (less than 200yds) ☐
4 Walking (more than 200yds but less than 1 mile) ☐
5 Walking (more than 1 mile) ☐
6 Walking a dog ☐
7 Cycling ☐
8 Picnicking ☐
9 Other (please specify) .....

14. *WHY DID YOU CHOOSE TO COME TO STUDLAND?*

.....

15. *IS THIS AREA SPECIAL TO YOU IN ANY WAY?*

Yes ☐ No ☐
What is special about it?

.....

16. *IS THERE ANYTHING THAT COULD BE DONE TO IMPROVE THIS AREA?*

Yes ☐ No ☐
If Yes, what?.....

.....

17. *WHAT CAN YOU YOURSELF DO TO HELP IMPROVE THE AREA?*

.....

18. *IF YOU HAVE WASTE OR RUBBISH AT THE END OF YOUR VISIT WHAT DO YOU INTEND TO DO WITH IT?*

1 Bury it on the beach ☐
2 Put in litter bin on beach ☐
3 Take home and put in litter bin ☐
4 Take home and recycle ☐
5 Other (please specify) .....

.....

19. *IN YOUR OPINION, IS THERE A PROBLEM WITH LITTER ON THE BEACH?*

Yes ☐ No ☐
Any comment?

.....

.....

****

THE NEXT FEW QUESTIONS ASK YOUR OPINION ABOUT LITTER: DO YOU AGREE/DISAGREE WITH THE FOLLOWING STATEMENTS: PLEASE TICK ONE OF THE RESPONSES BELOW FOR EACH STATEMENT):

20. *BY TAKING LITTER HOME, I WILL HELP CONSERVE THE STUDLAND ENVIRONMENT.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

20a. *PLEASE EXPLAIN WHY YOU CHOSE THE RESPONSE YOU DID?*

.....

21. *LITTER CAN BE HARMFUL TO WILDLIFE.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

22. *STUDLAND IS AN IMPORTANT AREA FOR WILDLIFE.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

23. *I SHOULD TAKE MY RUBBISH HOME AND RECYCLE IT.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

24. *BY TAKING MY RUBBISH HOME I WILL SAVE THE NATIONAL TRUST MONEY.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

25. *STOPPING THE SALE OF FOOD NEAR THE BEACH WOULD IMPROVE THE BEACH ENVIRONMENT.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

26. *DOG OWNERS SHOULD BE PREPARED TO CLEAN UP AFTER THEIR DOGS WITH A POOPER SCOOP.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

27. *REQUIRING DOGS TO BE KEPT ON LEADS LIMITS ENJOYMENT OF THE LOCAL ENVIRONMENT.*

1 Agree strongly ☐ 2 Agree ☐
3 No opinion ☐ 4 Disagree ☐
5 Disagree strongly ☐

****

28. *DID YOU RECEIVE A 'WELCOME TO STUDLAND' LEAFLET WHEN YOU ENTERED THE CAR PARK?*

Yes ☐ No ☐
Go to 33

29. *HAVE YOU LOOKED AT THE LEAFLET?*

Yes ☐ No ☐
Go to 30 Go to 32

30. *DID YOU FIND OUT ANYTHING NEW ABOUT THIS AREA FROM THE LEAFLET?*

Yes ☐ No ☐

If yes, what?.....

.....

31. *WHAT WAS THE MOST USEFUL INFORMATION IN THE LEAFLET?*

.....

.....

32. *CAN YOU REMEMBER WHAT YOU HAVE DONE WITH YOUR LEAFLET?*

.....

33. *IS THERE ANYTHING YOU WOULD LIKE MORE INFORMATION ON?*

.....

.....

.....

* END *

34. WOULD YOU MIND SUPPLYING THE FOLLOWING INFORMATION? *ARE YOU:*

1 Working full time (30+ hrs) ☐
2 Working part time (-30 hrs) ☐
3 On Government training scheme ☐
4 Unemployed ☐
5 Retired ☐
6 Out of work due to illness/ disability ☐
7 Housewife/husband ☐
8 In full-time education ☐

35. *WHAT BEST DESCRIBES THE NATURE OF YOUR CURRENT OR PAST OCCUPATION?* ARE YOU:

1 Professional/managerial ☐
2 Clerical/administrative ☐
3 Technical ☐
4 Manual labour ☐
5 Service (tourism, domestic,etc) ☐
6 Other ☐

THANK YOU FOR YOUR TIME AND PATIENCE!

WE HOPE YOU ENJOY YOUR VISIT.

heathland are part of Studland Heath National Nature Reserve. This brilliant area for wildlife is well known for rare species, including Sand Lizards, Smooth Snakes and over 80 pairs of Dartford Warblers. The Little Sea and coastline are particularly interesting for bird watching. We aim to care for wildlife - and would appreciate your help.

The National Trust and English Nature spend over £30,000 each year removing litter left on the beach and the Nature Reserves and in the bins. Please help us to keep the beach clean by taking your litter home. Let us spend this money on wildlife instead.

The National Trust still allows dogs on Studland Beach. Help everyone to enjoy their visit. Please keep your dog on a lead and clean up after it. Pooper scoops are available from the Knoll Beach Visitor Centre, please put used poop scoops in the bins provided.

Naturists are allowed towards the north of Studland Bay in the area marked with red-topped posts and signs. If you want to avoid the area follow the waymarked path through the dunes.

There is a serious risk of fire on the heathland. In 1986 a major part of the heathland caught fire, and many rare animals and plants died. Please use your barbecue only in the area provided in the car parks.

317

- Broadleafed Woodland
- Beach
- Car Park
- Nature Trail
- Footpath
- Bridleway
- Roads
- DCP Dorset Coast Path

The National Trust own most of the land shown.

Appendix 82a

YOU MAY SEE ME OR
MY COLLEAGUES AT WORK ON THE BEACH.
IF YOU NEED HELP PLEASE ASK ONE OF US AND WE
WILL BE ONLY TOO PLEASED TO ASSIST.

THE CAR PARK FEES HELP TO MAINTAIN THIS WILDLIFE AREA. YOU MAY SEE WORK TAKING PLACE BEHIND THE FENCES TO HELP PROTECT THE PLANTS AND ANIMALS AND STABILISE THE DUNES AGAINST EROSION.
PLEASE HELP US BY KEEPING OUT OF
THESE AREAS.

Studland has two nature trails and plenty of walks.
For leaflets and more information, ask at the:-

- Car park kiosks
- Knoll Beach Visitor Centre (Open Daily)
- Wildlife Information Centre (Open Sundays & Bank Holidays) 12 noon to 6.00pm.

The National Trust
Countryside Office,
Marine Terrace,
Studland,
Swanage,
Dorset. BH19 3AX
Tel: 01929 450259
Registered Charity No. 205846.

IN PARTNERSHIP FOR WILDLIFE

English Nature
Slepe Farm
Arne
Wareham
Dorset
BH20 5BN
Tel: 01929 556688

The National Trust owns the Studland Peninsula. It is a charity independent of the government, which has been founded to protect the best of our heritage for ever.

The Nature Reserve is managed by English Nature - the statutory advisor to the government on nature conservation in England. It promotes the conservation of England's wildlife and natural features, including the selection, establishment and management of National Nature Reserves.

WELCOME TO STUDLAND

Dorset Heath Marsh Gentian

ENJOY THE FINE SANDY BEACHES AND WILDLIFE AT A NATIONAL NATURE RESERVE.

READ ON FOR WHAT YOU CAN SEE

ENGLIS
NATUR

App-Six 8b

SECTION SIX: PART TWO, FIGURE ONE

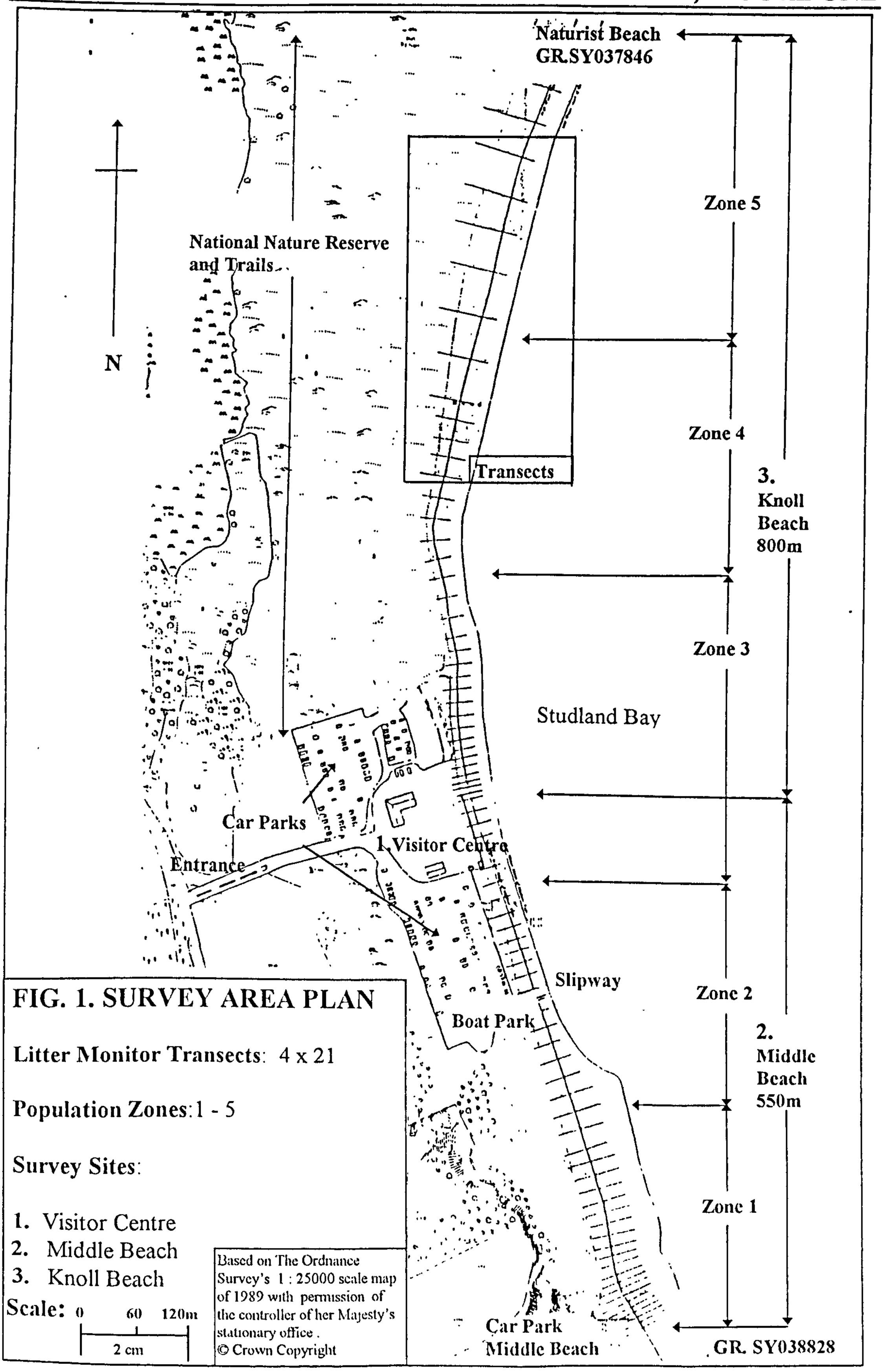


FIG. 1. SURVEY AREA PLAN

Litter Monitor Transects: 4 x 21

Population Zones: 1 - 5

Survey Sites:

1. Visitor Centre
2. Middle Beach
3. Knoll Beach

Scale: 0 60 120m

2 cm

From Clavin (1995)

Appendix 9c

National Trust Visitor Survey

July - Nov 1999

Avebury is a unique site containing evidence of people from earliest prehistoric times through to living, working community, of Avebury that exists today. The National Trust's conservation aims to seek to recognise the needs of visitors to this important site and the community that lives within its boundaries. Please help by answering the questions that follow.

Q1

Site: ____

Date: ____

Time: ____

Weather: ____

Q2 Have you previously visited Avebury in the last twelve months? (Please tick one box)

- No ☐
- Yes, once ☐
- Yes, twice ☐
- Yes, more than twice ☐

Q3 Where did you find the information you needed to make today's visit?

- National Trust Handbook ☐
- National Trust visitor's guide (leaflet) ☐
- English Heritage publication ☐
- Other leaflet ☐
- Newspaper / magazine advert ☐
- Article in newspaper / magazine ☐
- TV / Radio ☐
- Signpost when driving past ☐
- Friends / relatives ☐
- Saw it on a map ☐
- Previous visits ☐
- Tourist information centre ☐

Other (please specify) _____

Q4 What was the motivation for your visit today?

- Enjoyed a previous visit ☐
- Showing friends or relatives the area ☐
- Location for a walk ☐
- Location for a picnic ☐
- A family day out ☐
- Educational trip ☐
- Part of an organised excursion ☐
- Seen the publicity ☐
- Always wanted to visit ☐
- Walk the dog ☐
- Walk amongst the stones ☐
- Visit the museum ☐
- West Kennet Longbarrow ☐
- Avebury Manor House ☐
- Windmill Hill ☐
- Silbury Hill ☐
- The restaurant / shop ☐
- The Ridgeway ☐
- The Sanctuary ☐
- Visit the local pub ☐
- Walk along the Avenue ☐
- Other _____

Q5 Where did you set out from today?

Nearest Town ____

County ____

Q6 About how far away is that?

- Under 5 miles ☐
- 5 - 14 miles ☐
- 15 - 24 miles ☐
- 25 - 49 miles ☐
- 50 - 74 miles ☐
- 75 miles or more ☐

Q7 Are you?

Male ☐ Female ☐

Q8 What was your age last birthday?

18 - 24 years ..... ☐
25 - 34 years ..... ☐
35 - 44 years ..... ☐
45 - 54 years ..... ☐
55 - 64 years ..... ☐
65 + years ..... ☐

Q9 Including yourself, how many people are there in your personal group?

Children (aged under 11) ☐
Children (aged 11-16) ☐
Adults ☐

Q10 Is there anything about Avebury which makes it a particularly special place to you personally?

Yes..... ☐
No ..... ☐

If yes, why is it special to you? _____

Q11 Does the term World Heritage Site mean anything to you?

Yes..... ☐
No ..... ☐

If yes, what does it mean to you? _____

Q12 What do you think are the advantages to Avebury of having many visitors?

_____

Q13 What do you think are the disadvantages to Avebury of having many visitors?

_____

Q14 Have you noticed any effects of visitors on the site at Avebury on your visit today?

Yes..... ☐
No ..... ☐

If yes, what effects have you noticed? _____

Q15 Do you think your visit today is likely to have any effect on the site?

Yes..... ☐
No ..... ☐

If yes, what effect? _____

The photo below shows one of the problems the National Trust has to deal with in managing Avebury.

Q16 What would you say the problem is? (Picture above)

_____

_____

Q17 What do you think could be done to resolve the problem?

_____

_____

Q18 Which of the following management actions would you accept to help the preservation of Avebury? (Please tick those you would accept

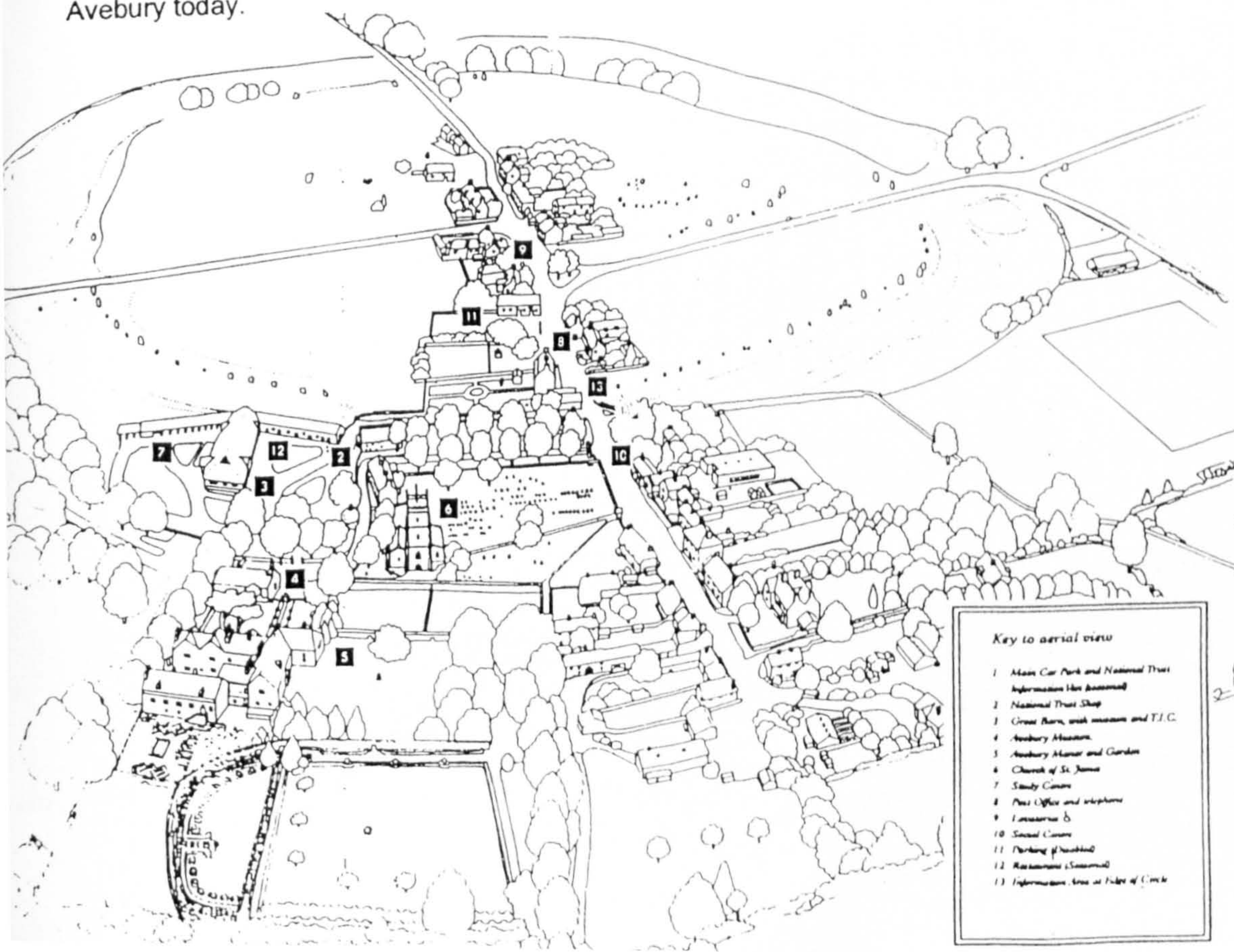
	Acceptable	Not acceptable
New routes for the paths to avoid worn areas	☐	☐
Paths closed to allow worn areas to recover	☐	☐
Not walking on areas fenced off to allow grass to grow	☐	☐
Only walking on dedicated paths	☐	☐
Not walking on top of the hedge banks	☐	☐
Closure of parts of the monument in winter	☐	☐
Closure of parts of the monument all year	☐	☐
Not walking on areas with erosion control signs	☐	☐
Spend more time and money on repairs	☐	☐
Charge a car park fee which is spent on repair work	☐	☐

Other (please state) _____

If any of these are not acceptable please state which ones and why? _____

_____

Q19 Please show on the map your route around Avebury today.



Q20 Which other museums, sites of historical attraction have you visited during the past 6 months? (Please list below)

_____

_____

_____

_____

Q21 Are you:

Travelling from home ..... ☐
On holiday 1-3 nights ..... ☐
On holiday 4+ nights ..... ☐
Visiting friends and relatives ..... ☐
Passing through ..... ☐
Other _____

Q22 Are you a member of:

The National Trust ..... ☐
English Heritage ..... ☐

Q23 Approximately how long has your visit lasted today?

Less than 1 hour ..... ☐
1 - 2 hours ..... ☐
2 - 3 hours ..... ☐
More than 3 hours ..... ☐

Q24 How did you travel here today?

Walking ..... ☐
Public transport ..... ☐
Special bus / organised group ..... ☐
Cycling ..... ☐
By car ..... ☐
Other (please specify) _____

Q25 Do you recall the direction from which you approached Avebury?

Calne ..... ☐
Marlborough ..... ☐
Swindon ..... ☐
Devizes ..... ☐
Don't Know ..... ☐

Q26 Where is your home?

Town
County
Country
Postcode

Thank you for spending time to fill in this questionnaire, do you have any comments on how your visit could be made more enjoyable?

TEXT BOUND INTO THE SPINE

Appendix 9b

National Trust Visitor Survey

Avebury

ar Visitor,
uld you please help the National Trust by providing a few details of your visit today? We are constantly working to vide an enjoyable and informative experience at all of our properties. The information you provide will help us to do this ll.

r questionnaire is completely confidential and will only take a few minutes to complete. We are attaching a stamped, dressed envelope so that you can take it away and complete at your leisure.

mply indicate your chosen answer by ticking the appropriate option or writing in the space provided.

e ask that one person fill in the questionnaire only.
ank you for your help.

Please enter the date of your visit

Date

Approximately what time did you arrive?

Time

What was the weather like?

Sunny ○ Heavy Rain ○
Overcast ⊘ Other ○
Showers ○

Are you a member of the National Trust?

Yes ○ Please go to Q6 No ○ Please go to Q5

Have you ever visited any other National Trust property?

Yes ○ No ○

Have you visited this site before today?

Yes ○ Please go to Q8 No ○ Please go to Q10

Approximately when did you last visit this site?

During the past 12 months ○
Over 1 year ago ○
2 -3 years ago ○
More than 3 years ago ○
Don't know ○

Approximately how many times have you visited this site in the past year, not including today?

Once ○ More than twice ○
Twice ○

Q9 Where did you find the information you needed to make today's visit? Please tick all that apply.

National Trust Handbook ○
National Trust Local Leaflet ○
Other Leaflet* (Please specify below) ○
Posters ○
Advertising Newspaper/Magazine ○
Article Newspaper/Magazine/TV/Radio ○
Brown road signs ○
Tourist Information Centre* (Please write the location below) ○
Friends & Relatives ○
Saw it on the map ○
Internet website, National Trust ○
Internet website other ○
National Trust Newsletter ○
National Trust Magazine ○
Recommended by a National Trust property ○
Recommended at holiday accommodation ○
Previous visits/local knowledge ○

* Name of leaflet _____

* Name of Tourist Information Centre _____

What was your motivation to visit this site today? Please rank the following options in terms of importance on a scale of 1to8, with 1 being the most important aspect and 8 being the least important aspect.

A short walk (over 1 mile) ☐

A long walk (over 1 mile) ☐

To enjoy the view ☐

Interest in the landscape ☐

Interest in the history/archaeology ☐

Interest in the wildlife/birds+animals ☐

Interest in the plants and flowers ☐

Peace & quiet ☐

To entertain / educate children ☐

To show friends & relatives ☐

In the area ☐

Restaurant ☐

Shop ☐

Other ☐

Please specify

_____

11 Overall how would you rate the time you have spent here today? If you are accompanied by children please rate their enjoyment?

	Very enjoyable	Enjoyable	Acceptable	Not Enjoyable	Disap.
You	○	○	○	○	○
Children	○	○	○	○	○

If you ticked either 'Not Enjoyable' or 'Disappointing' for any of the above please can you give some reasons for your decision? _____

12 Have you purchased a guidebook or other information for your visit today?

Yes ..... ○ If Yes please specify below No ..... ○

If 'yes' what did you buy

_____

13 What aspects of this area would you like more information about? Please tick all that apply.

The people that lived & worked here..... ○

The landscape..... ○

The history/archaeology ..... ○

The wildlife/birds..... ○

The plants and flowers. ○

Other..... ○

If you ticked other please specify the additional information you would like. _____

Q14 How would you like the information to be presented? Please tick all that apply.

Free leaflet ..... ○

More detailed leaflet to buy..... ○

Publication to buy..... ○

Information boards on site..... ○

Permanent exhibition ... ○

Audio guides ..... ○

Video to buy and take home..... ○

Guided walk ..... ○

Other..... ○

If you ticked other please specify how you would like the information to be presented. _____

Q15 If you have children in your group what do you think of the information provided for them?

	Unhelpful	Not V Helpful	Helpful	V Helpful	Exceptional
Information	○	○	○	○	○

If you ticked either 'Not Very Helpful' or 'Unhelpful' please can you give some reasons for your decision? _____

Q16 How would you rate the importance of the following leisure time? Please tick one box in each row if appropriate to this visit.

	V Imp	Imp.	Neither Imp. or Unimp.	Unimp.	V. Unimp	Don't Know
Historical association/ history	○	○	○	○	○	○
Scenery	○	○	○	○	○	○
Art & architecture	○	○	○	○	○	○
Library association	○	○	○	○	○	○
Gardens	○	○	○	○	○	○
Romantic locations	○	○	○	○	○	○
Interesting places to walk	○	○	○	○	○	○
Archaeological sites	○	○	○	○	○	○
Interesting buildings	○	○	○	○	○	○
Relaxing places to enjoy tea/coffee	○	○	○	○	○	○
Range of interesting books	○	○	○	○	○	○
Interesting things to buy	○	○	○	○	○	○
Relaxing environment	○	○	○	○	○	○
Other	○	○	○	○	○	○

Please specify

_____

17 Have you visited any of the following during the past 6 months or year.

	6 months	1 Year
Museums	○	○
Stately Homes	○	○
The Countryside	○	○
Cathedrals and/or historic churches	○	○
Non NT properties or sites	○	○
NT property	○	○
NT Countryside	○	○
Art Gallery	○	○
Historic town or village	○	○
Ancient/historic site	○	○
No comment	○	○

18 If you have not visited a national trust property or site recently please can you state your reason below.

Just not interested ..... ○
Too busy ..... ○
Family/friends not interested ..... ○
They are too expensive ○
Difficult to get to ..... ○
No particular reason .... ○
Other leisure priorities . ○
Don't Know..... ○
Other..... ○

Please specify _____

19 Please note here the names of any non National Trust historic property, gardens, or sites that you have visited in the last year in this area.

_____

Approximately how long has your visit lasted today?

Less than 1 hr ..... ○
Between 2-3 hrs ..... ○
1-2 hrs..... ○
More than 3 hrs ..... ○

21 May we ask the approximate ages of people in your group? Please write the number of members in your group that fall into each age category?

	Male	Female
Under 5's yrs	___	___
6-10 yrs	___	___
11-16 yrs	___	___
17-24 yrs	___	___
25-34 yrs	___	___
35-44 yrs	___	___
45-54 yrs	___	___
55-64 yrs	___	___
65+ yrs	___	___

Q22 Where have you travelled from today?

Home ..... ○
Camping/caravan site.. ○
Hotel ..... ○
Friends & relatives..... ○
Guest house..... ○
Other (Please specify) . ○

Travelled from

_____

Q23 About how far away is this?

Under 5 miles ..... ○
25-49 miles ..... ○
5-14 miles ..... ○
50-74 miles ..... ○
15-24 miles ..... ○
75+ miles ..... ○

Q24 Please enter your full postcode in the box below. If you live outside the UK please state your home country instead.

Full Postcode or Home Country? _____

Q25 Are you?

On holiday, 4 nights or more ..... ○
On a weekend or short break..... ○
On a day trip from home..... ○
Local business trip..... ○
Other (please specify).. ○

_____

Q26 If you have heard of the National Trust do you agree with what it does?

Yes..... ○
Don't Know..... ○
No..... ○

Q27 Please rank the following aspects of the National Trust in terms of importance on a scale of 1to9, with 1 being the most important aspect and 9 being the least important aspect.

Conservation of houses _____
The art collections _____
The furniture collection _____
Countryside Conservation _____
Wildlife conservation _____
Gardens _____
Showing how people lived _____
Providing a good day out _____
Peace and quiet _____

Q28 Have you visited the exhibition, 'Avebury, 6000 years of mystery' in the Great Barn?

Yes ..... ○ Please go to Q30
No..... ○

29 If no why not?

Not enough time ..... ○ Not interested ..... ○

Too expensive ..... ○ Other ..... ○

Please specify _____

30 What did the children in your party most enjoy about the exhibition?

_____

31 How would you rate your enjoyment of the following parts of the exhibition?

	Very Enjoyable	Enjoyable	Acceptable	Not Enjoyable	Disappointing
The hands on exhibits (Silbury Hill, feely box etc.)	○	○	○	○	○
The CD-Rom	○	○	○	○	○
The text panels	○	○	○	○	○
The video	○	○	○	○	○
The models	○	○	○	○	○
he folios	○	○	○	○	○
The children's area	○	○	○	○	○

If you ticked not very enjoyable or disappointing for any of the above can you give some reason? _____

32 How did the exhibition help you appreciate the following points about Avebury?

	Unhelpful.	Not Very Helpful	Helpful	Very Unhelpful	Exceptional
The changes in the landscape through time..	○	○	○	○	○
Who built the Avebury henge, how, when and why?	○	○	○	○	○
The people who discovered Avebury	○	○	○	○	○
The way of life at the time the henge was built	○	○	○	○	○
Understanding features in the landscape	○	○	○	○	○
How we find out about events in the past and the archaeological techniques involved	○	○	○	○	○

Q33 How long have you spent in the exhibition?

Less than 10 minutes .. ○ 30 minutes - 1 hour ..... ○

10-20 minutes ..... ○ More than 1 hour ..... ○

20-30 minutes ..... ○

Q34 If there was one aspect of the exhibition which could be improved what would it be?

_____

Q35 Have you walked around the henge today?

Yes ..... ○ No ..... ○

Q36 Has anything influenced where you walked today?

Yes ..... ○ No ..... ○

Q37 Have you noticed any effects of visitors on the site at Avebury during your visit today?

Yes ..... ○ No ..... ○

If 'yes', what effects have you noticed _____

Q38 Do you think your visit today is likely to have any effect on the site

Yes ..... ○ No ..... ○

If 'Yes' what effect? _____

Q39 Have you looked at the welcome leaflet today?

Yes ..... ○ No ..... ○

Q40 Did any information on the leaflet change what you did at Avebury today?

Yes ..... ○ No ..... ○

If 'yes' what information made you change and how did you alter what you did _____

Q41 Please include any other comments you may have below.

_____

_____

Thank You Very Much For Your Help

Appendix 9c

Avebury Visitor Survey

To investigate managing visitors at Avebury.

Q1 Date

Q2 Weather

Q3 What was your motivation to visit this site today? Please rank the following options on a scale from 1-5 with 1 being most important.

- *A short walk*
- *A long walk (More than 1 mile)*
- *To walk the dog*
- *To enjoy the view*
- *Interest in the landscape*
- *Interest in history/archaeology*
- *Interest in wildlife*
- *Interest in plants and flowers*
- *Interest in spirituality*
- *Peace & Quiet*
- *To entertain/educate children*
- *To show friends & relatives*
- *In the area*
- *Restaurant*
- *Shop*
- *Other, please specify*

Q4 Have you noticed any effects caused by visitors to the Avebury site during your visit?

- *Yes*
- *No*
- *If 'Yes' please specify*

Q5 Do you think your visit today is likely to have an effect on the site?

- *Yes*
- *No*

Q6 What effect is your visit likely to have?

Q7 Do you think that you would change your behaviour in any way to help prevent erosion?

- *Very Likely*
- *Likely*
- *Neither*
- *Unlikely*
- *Very Unlikely*

Q8 How likely are you to have carried out any of the following actions during your visit?

	V Likely	*Likely*	*Neither*	*Unlikely*	*V Unlikely*
Use a different route to avoid a worn area					
Avoid a path closed to allow a worn area to recover					
Only walk on defined paths to get to the top of the henge banks					
Walk up grassy slopes to get to the top of the henge banks					
Not walk on top of the henge banks					
Not walk on areas with erosion control signs					
Give a donation with the car park fee to help preserve the monument					

Q9 Many of my friends, family and people who are important to me feel that activity that causes erosion at Avebury should be avoided if possible

Agree strongly ☐
Agree ☐
Neither ☐
Disagree ☐
Disagree strongly ☐

Q10 I am influenced by the views of family and friends and others important to me regarding their views on preserving Avebury

Agree strongly ☐
Agree ☐
Neither ☐
Disagree ☐
Disagree strongly ☐

Q11 Have you looked at the welcome leaflet today? (Leaflet with map of Avebury)

Yes ☐
No ☐

Q12 Did any information in the leaflet influence what you did at Avebury today?

Yes ☐
No ☐

Q13 What information was that and what did you do as a result?

Q14 Did any signs on the site influence where you walked today?

Yes ☐
No ☐

Q15 What sign was that and how did it affect what you did?

Q16 Did you learn anything new about this area from the welcome leaflet?

Yes ☐
No ☐

Q17 What did you learn?

Q18 What was the most useful item in the leaflet

Q19 Are you a member of any conservation body

Yes ☐
No ☐
If 'Yes' please note which

Q20 Age

Under 16 ☐
Valid17-24 ☐
25-34 ☐
35-44 ☐
45-54 ☐
55-64 ☐
65+ ☐

Q21 Gender?

Male ☐
Female ☐

Q22 Where have you travelled from today?

Home ☐
Hotel ☐
Guest House ☐
Camping/caravan site ☐
Friends & relatives ☐
Other please specify

Q23 Travelled from?

Q24 Are you?

On Holiday 4+ nghts ☐

Short break ☐

Day trip from Home ☐

A short outing ☐

Walking the dog ☐

Q25 How often do you visit Avebury?

Every day ☐

Once or twice a week ☐

At least once a month ☐

Once every few months ☐

Once a year ☐

First visit ☐

Q26 Approximately how long has your visit lasted?

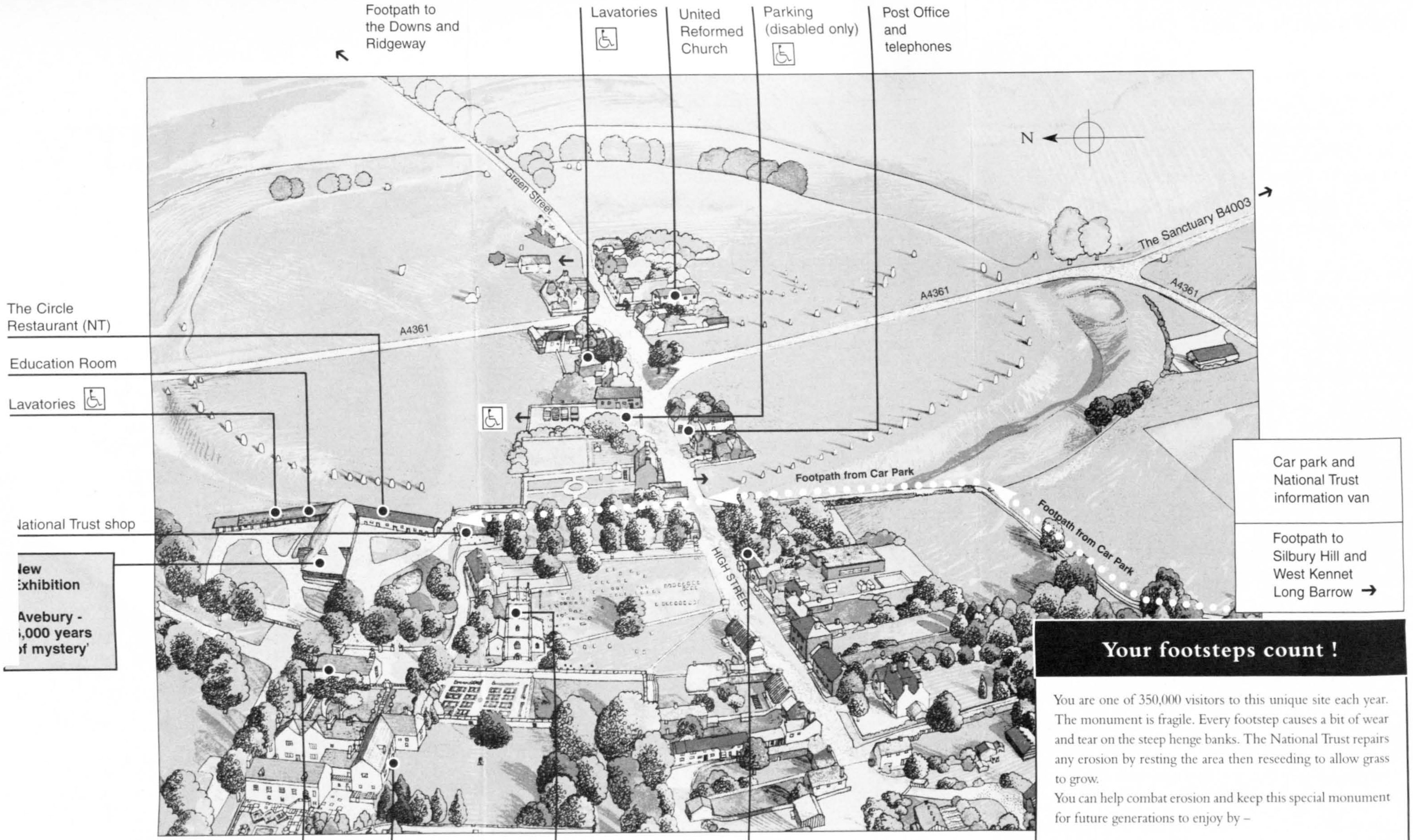
Less 1 hr ☐

1-2 hrs ☐

2-3 hrs ☐

More 3 hrs ☐

Thank you for your help. Any other comments?



Your footsteps count !

You are one of 350,000 visitors to this unique site each year. The monument is fragile. Every footstep causes a bit of wear and tear on the steep henge banks. The National Trust repairs any erosion by resting the area then reseeding to allow grass to grow.

You can help combat erosion and keep this special monument for future generations to enjoy by –

- ❑ Not walking on paths marked with erosion control signs
- ❑ Keeping out of fenced off areas.

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Appendix 10

Information to help you:

The henge at Avebury is one of the greatest achievements of prehistoric Europe. The great stone circle and inner circles are surrounded by a massive bank and ditch built 5,000 years ago. To find out more and explore the outlying monuments read 'Walking around Avebury' price £2.50 from the information van in the car park or National Trust shop.

Visit the new exhibition about the Avebury monuments, 'Avebury, 6,000 years of mystery' in the historic Manor Barn.
Open 10am-6pm daily in summer (April to October), 10am-4pm in winter (November to March).

Your joint ticket also gives entry to the Alexander Keiller Museum housing the prehistoric archaeological collections, open at the same times as exhibition.

Relax in the peaceful Edwardian garden of topiary and shrubs at Avebury Manor and visit the Manor house with monastic origins. House open Tues, Wed, Sun and BH Mon 2pm - 5.30pm (April to October). Garden open Tues, Wed, Fri, Sat, Sun & BH Mon 11 am - 5.30pm (April to October).

The 'Circle' vegetarian restaurant and National Trust shop open daily 11am - 5pm in summer (April to October). Daily except Mon and Tues 11.30am - 4pm in winter (November to March).
L Lavatories off the High street near the Red Lion pub and behind the Manor Barn (open same times as exhibition) .

Facilities for visitors with disabilities - a large print guide is available from the information van giving access details to the henge.

Picnic area behind the Manor Barn.

Next time you visit Avebury why not leave the car at home and come by public transport.
Information on bus services from the Wiltshire bus enquiry line – 0345 090899

Buses: Monday to Saturday

5/6	Salisbury - Amesbury - Marlborough - Avebury - Swindon
48/48A	Swindon - Waneborough - Marlborough - West Overton - Avebury
49	Trans Wiltshire Express Swindon - Avebury - Devizes - Trowbridge
43/X43	Calne - Avebury (Mon to Fri)

Sunday and Bank holidays

6	Salisbury - Amesbury - Marlborough - Avebury - Swindon
49	Swindon - Avebury - Devizes

Railway Station at Swindon

The National Trust is Europe's leading conservation charity. It is independent of Government and needs your support. You can join the National Trust today when you visit the exhibition in the Manor Barn and get free admission to over 300 historic houses and 200 gardens in England, Wales and Northern Ireland.

Welcome to

Avebury

World Heritage Site

Appendix 11
Description of Avebury visitor groups

	Origination	Activities	Interests	Frequency of visits	Demographic profile
Local day trippers 17% of sample	Marlborough, Calne, Devizes, Swindon (42%)	Walkers/dog-walkers up to one mile (41%)	General interest in the site, no specific area, high sense of ownership, interest in current issues affecting the site.	High number of repeat visits (64%), non seasonal	45+ (51%), higher percentage of females (63%)
Day trippers 15% of sample	South coast, Bath/Bristol, Oxford, Reading, West London, Southampton (41%), includes holiday makers staying in these areas (19%), Schools and Colleges (14%)	Sightseeing, walking, picnics	Interest in the general history of the site, some archaeology (key dates of monuments/sites) principal characters involved historically. Moderately high sense of ownership.	Moderately high number of repeat visits (34%), non seasonal residents , seasonal holidaymakers	24+ (32%), male (55%) /female (45%),
Archaeological/ Historical Interest Groups 19% of sample.	South coast, Bath/Bristol, Oxford, Reading, West London, Southampton (45%), includes holiday makers staying in these areas (18%), Schools and Colleges (3%), overseas visitors (mainly European, Dutch, German, French (11%) and U.S. 4%) also staying in region (48%)	Viewing evidence, expanding understanding	Interest in the prehistoric archaeology of the site (dates, excavations, principal findings). Moderately high sense of ownership but within a wider margin of tolerance. For instance this group is relatively unconcerned with developments in the Great Barn area or any change in the infrastructure provision for tourists	Low number of repeat visits (18%), seasonal but with higher than average levels of visiting in off peak season	24+ (27%), male (49%) /female (51%),
Environmental Interest Groups	South coast, Bath/Bristol, Oxford, Reading,	Walking, appreciation of landscape, flora, fauna,	Principal interest the Monuments in the landscape, interest in the prehistoric	Low number of repeat visits (14%), seasonal but	24+ (27%), male (49%) /female (51%),

18% of sample	West London, Southampton (11%), includes holiday makers staying in these areas (17%), Schools and Colleges (5%), overseas visitors mainly younger Europeans.	social/community aspects.	archaeology of the site guided by aesthetics. Developed interest in the people of Avebury through history how they lived/farmed the area, their beliefs. Moderately high sense of ownership but within a wider margin of tolerance	with higher than average levels of visiting in off peak season.	
Spiritually Motivated 16% of the sample	South coast, Bath/Bristol, Oxford, Reading, West London, Southampton (12%), includes some holiday makers staying in these areas (5%), wider U.K., Eire (32%) overseas visitors mainly younger Europeans some U.S. (0.5%).	Personal/ communal meditation.	Principal interest the Monuments and their spiritual significance.	Low number of repeat visits (12%), non seasonal. At certain times of the year/day this group can be in the majority within the WHS.	24-45+ (15%), male (57%) /female (43%), druid (23% - some difficulty in definition), new age (46%), pantheists (18%)
Casual, non specific visitor 12% of the sample	Local within 15 miles (12%) South coast, Bath/Bristol, Oxford, Reading, West London, Southampton (22%), includes holiday makers staying in these areas (15%), few overseas (1%).	Walking around Henge	Principal interest the Monuments, interpretation of monuments.	Low number of repeat visits (10%), seasonal	24-45+ (12%), male (51%) /female (49%),

Appendix 12a

Appendix 12b

THE NATIONAL TRUST

Parts of the monument are temporarily closed in order to prevent further footpath erosion. Visitors are requested <u>not</u> to walk on these areas of the monument while the grass is allowed to recover.

An estimated 350 000 people visit Avebury every year each of whom contributes to erosion of the site. During the winter the monument can become very muddy, slippery and archaeological deposits are vulnerable to erosion. In order to prevent further damage areas are closed to allow the grass to recover.

Please help The National Trust in controlling erosion by <u>not</u> walking on the closed areas.

For further information please phone Avebury Estate Office 01672 539203.